IJM 4: 11–50 (2011)
doi: 10.3897/ijm.4.1116
www.pensoft.net/journals/ijm

RESEARCH ARTICLE

A peer-reviewed open-access journal
INTERNATIONAL JOURNAL OF
Myriapodology

A review of the species in the genus *Cryptops* Leach, 1815 from the Old World related to *Cryptops* (*Cryptops*) *hortensis* (Donovan, 1810) (Chilopoda, Scolopendromorpha)

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Academic editor: *Pavel Stoev* | Received 9 February 2011 | Accepted 20 April 2011 | Published 4 June 2011

Citation: Lewis JGE (2011) A review of the species in the genus *Cryptops* Leach, 1815 from the Old World related to *Cryptops (Cryptops) hortensis* (Donovan, 1810) (Chilopoda, Scolopendromorpha). International Journal of Myriapodology 4: 11–50. doi: 10.3897/ijm.4.1116

Abstract

The subgenus *Cryptops* may be divided into those species with, and those without, an anterior transverse suture on tergite 1. The latter group may be further separated into species with the ultimate leg femur without a saw tooth or teeth (here termed the *hortensis* group) and those with one or more (here termed the *doriae* group). The species of the Old World of the *hortensis* group are the subject of this paper. Where possible, the non-European type material has been examined and data for European species added from the literature. *C. omissus* Ribaut, 1915 (Kenya), *C. mirus* Chamberlin, 1920 (Tahiti) and *C. arapuni* Archey, 1922 (New Zealand), lacking ultimate legs cannot be assigned to either the *hortensis* or the *doriae* group. *C. inermipes* Pocock, 1888, which lacks saw teeth on the ultimate legs is considered here. *C. nanus* Attems, 1938 (Hawaii), *C. navis* Chamberlin, 1930 (Singapore), *C. philammus* Attems, 1928 (Southern Africa), *C. sinesicus* Chamberlin, 1940 (China), *C. stupendus* Attems, 1928 (South Africa) and *C. tahitianus* Chamberlin, 1920 (Tahiti) appear from their descriptions to belong to the *hortensis* group but have a prefemoral saw tooth or teeth and thus belong to the *doriae* group.

The following species are regarded as valid: *C. covertus* Chamberlin, 1951, *C. daszaki* Lewis, 2002, *C. decoratus* Lawrence, 1960, *C. hortensis* (Donovan, 1810), *C. inermipes* Pocock, 1888, *C. lobatus* Verhoeff, 1931, *C. mauritianus* Verhoeff, 1937, *C. melanotypus* Chamberlin, 1941, *C. nigropictus* Takakuwa, 1936, *C. parisi* Brolemann, 1920, *C. songi* Song et al., 2010 and *C. stabilis* Chamberlin, 1944. Examination of further material is required to establish the true status of *C. brignolii* Matic, 1977, currently regarded as valid. *C. hortensis atlantis* Pocock, 1891 is returned to full specific status as *C. atlantis*.

C. basilewskyi Matic & Darabantu, 1977, *C. kalobensis* Goffinet, 1971 and *C. niloticus* Lewis, 1967 are junior subjective synonyms of *C. nigropictus*. *C. penicillatus* Lawrence, 1960 is a junior subjective synonym of *C. decoratus* and *C. decoratus* sensu Lewis (from Mauritius and Seychelles) is a junior subjective synonym of *C. melanotypus*. *C. parisi cottarellii* Matic, 1977, and *C. parisi rhenanus* Verhoeff, 1931 are junior subjective synonyms of *C. parisi*. *C. campestris* Attems, 1953, *C. compositus* Chamberlin, 1952, *C. medius* Verhoeff, 1901, *C. orthus* Chamberlin, 1951, *C. parisi sebini* Verhoeff, 1934 and *C. philammus gabonensis* Demange, 1968 are regarded as nomina dubia.

A key is provided to the fourteen species considered valid. However, the status of four of them, namely *C. nigropictus*, *C. decoratus, C. melanotypus* and *C. songi,* which are very similar, and the species that have been here synonymised with them, is uncertain. More material and more refined techniques are required to ascertain their exact status. Whatever that is, however, there can be little doubt that we are dealing with some closely related and very widely distributed populations. This suggests that *Cryptops* species are easily dispersed over large distances.

Keywords

Chilopoda, *Cryptops hortensis* group, Old World, review, key

Introduction

The subgenus *Cryptops* (*Cryptops*) Leach 1815 may be conveniently divided into those species with, and those without, an anterior transverse suture on tergite 1. The latter group may be further separated into species with the ultimate leg femur without a saw tooth or teeth (here termed the *hortensis* group) and those with one or more (here termed the *doriae* group). This subdivision may well not be a natural one but is convenient for the present, bearing in mind the parlous state of *Cryptops* taxonomy.

The *hortensis* group of *Cryptops* is the subject of the present paper. It is characterised by a cephalic plate without complete paramedian sutures and generally overlapped by tergite 1, tergite 1 without sutures, and no saw teeth on the femur of the ultimate leg. *Cryptops inermipes* Pocock, 1888, characterised by the complete lack of saw teeth on the ultimate legs, is also considered here.

Cryptops (*C.*) *zelandicus* Chamberlin, 1920, which would appear from the description to belong to the *hortensis* group, was synonymised under *C. spinipes* Pocock, 1891 by Archey (1924) who re-examined Chamberlin's specimen. Attems (1930) maintained it as a separate species ignoring Archey's comments. Edgecombe (2005) transferred *C. spinipes* to the subgenus *Trigonocryptops* Verhoeff, 1906.

The following species: *C. omissus* Ribaut, 1915 (Kenya), *C. mirus* Chamberlin, 1920 (Tahiti) and *C. arapuni* Archey, 1922 (New Zealand), have no anterior transverse suture on tergite 1 but cannot be assigned to either the *hortensis* or the *doriae* groups as they lack ultimate legs.

Some species that would appear from their descriptions to belong to the *hortensis* group in fact have a prefemoral saw tooth or teeth and thus belong to the *doriae* group. They are: *C. nanus* Attems, 1938 (Hawaii) (Lewis 2011), *C. navis* Chamberlin, 1930 (Singapore), *C. philammus* Attems, 1928 (Southern Africa), *C. sinesicus* Chamberlin,

1940 (China), *C. stupendus* Attems, 1928 (South Africa) and *C. tahitianus* Chamberlin, 1920 (Tahiti) (Lewis, unpublished data).

Materials and methods

Specimens were studied by light microscopy using an eyepiece graticule to make drawings onto squared paper calibrated for different magnifications using a stage micrometer. They were examined by reflected light in the preservative (70 or 80% ethanol) and sometimes blotted off briefly to observe surface features such as sulci. They were cleared in 2-phenoxyethanol which was also used as mounting medium for temporary mounts.

The Old World in the title of this paper is taken to mean the Palaearctic, Afrotropic, Afrotemperate and Oriental regions as defined by Morrone (2002). No members of the *hortensis* group have been recorded from Australasia. The *Cryptops* species of the Americas were not considered. Where possible, non-European type material has been examined; data for European species have been added from the literature. The species are dealt with in alphabetical order. Brief synonymies are given; for full synonymies see Minelli (2006). The terminology for the external anatomy proposed by Bonato et al. (2010) is followed here. The provisional key provided has drawbacks but specific diagnoses given should allow confirmation of identity even though taxonomic relationships may not be always have been resolved. Table 1 shows the status of the species.

Conventions and abbreviations used are: [d] indicates that the antenna is damaged, i.e. that it has some articles missing, [r] indicates that the antenna is regenerated.

Uncommon numbers are given in parentheses.

Acronyms

ANSP Academy of Natural Sciences, Philadelphia, Pennsylvania, USA.
BMNH Natural History Museum, London, U.K.
MNHN Muséum national d'Histoire naturelle, Paris, France.
NMNH National Museum of Natural History, Smithsonian Institution, Washington DC, USA.
NMW Naturhistorisches Museum, Vienna, Austria.
MRAC Musée Royal de l'Afrique Centrale, Tervuren, Belgium.

The following taxa are considered here:

C. basilewskyi Matic & Darabantu, 1977
C. brignolii Matic, 1977
C. campestris Attems, 1952
C. compositus Chamberlin, 1952
C. covertus Chamberlin, 1951

C. daszaki Lewis, 2002
C. decoratus Lawrence, 1960
C. hortensis hortensis (Donovan, 1810)
C. hortensis atlantis Pocock, 1891
C. inermipes Pocock, 1888
C. kalobensis Goffinet, 1971
C. lobatus Verhoeff, 1931
C. mauritianus Verhoeff, 1937
C. medius Verhoeff, 1901
C. melanotypus Chamberlin, 1941
C. nigropictus Takakuwa, 1936
C. niloticus Lewis, 1967
C. orthus Chamberlin, 1951
C. parisi parisi Brolemann, 1920
C. parisi cottarellii Matic, 1977
C. parisi rhenanus Verhoeff, 1931
C. parisi sebini Verhoeff, 1934
C. penicillatus Lawrence, 1960
C. philammus gabonensis Demange, 1968
C. songi Song et al., 2010
C. stabilis Chamberlin, 1944

Review of species

Cryptops basilewskyi Matic & Darabantu, 1977

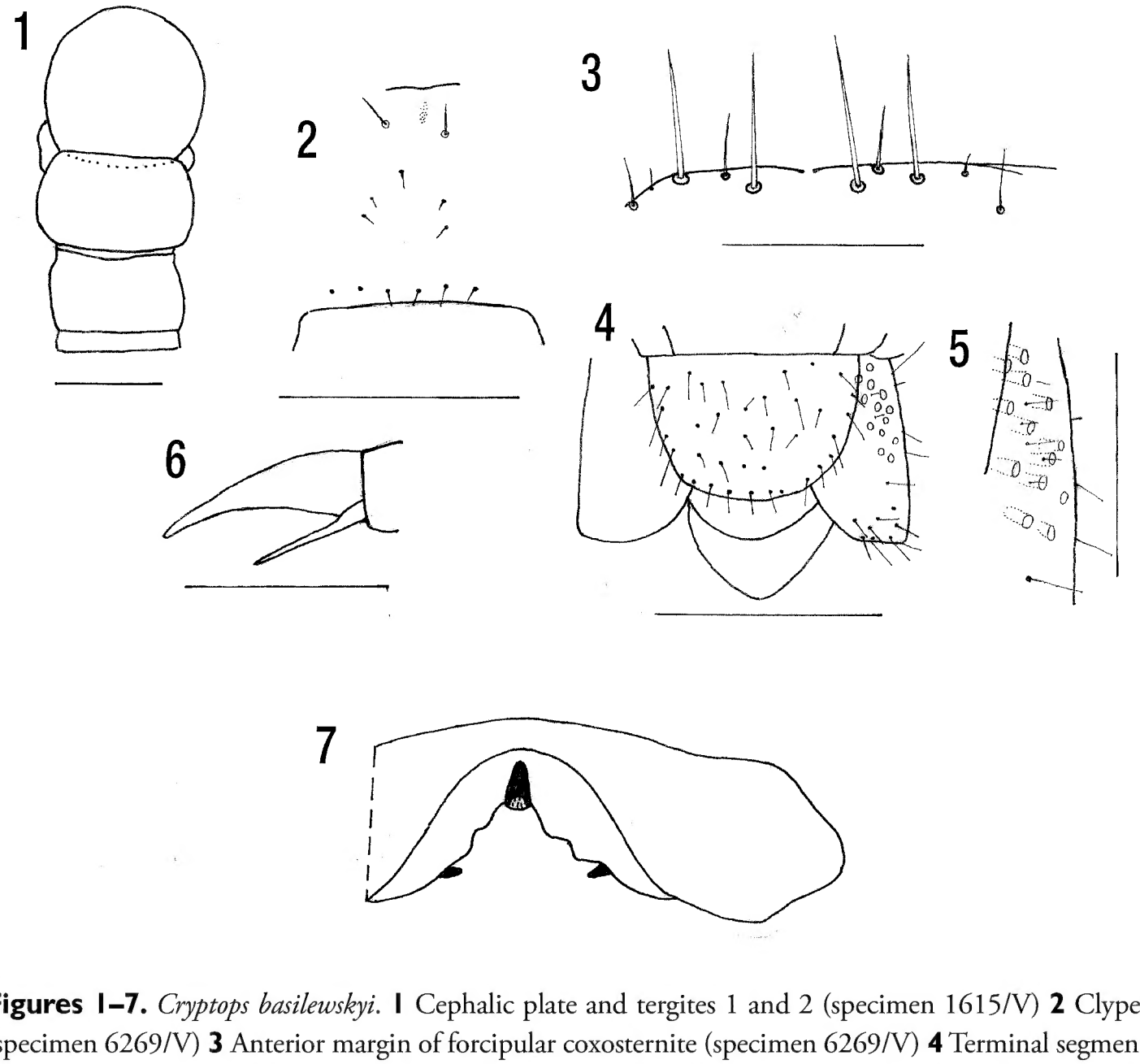
http://species-id.net/wiki/Cryptops_basilewskyi
Figs 1–6

C. basilewskyi Matic & Darabantu, 1977. La Faune Terrestre de l'ile de Sainte-Helene. Quatrième Partie, 2. Chilopoda: 345–359, fig. 142 (a-f).

Material examined. BMNH. 891/V P. and M. Ashmole, St Helena, September to December 2003 (18 mm); 6269/V Prosperous Bay 21.ii.06, P. Ashmole (17 mm).

P. Ashmole's collection. 1756/V (14 mm); 67/V (16 mm); 452/V (18 mm); 1615/V (18 mm); P and M. Ashmole, St Helena, September to December 2003.

Preliminary remarks. The type material of *C. basilewskyi* was described from Prosperous Bay, St Helena by Matic and Darabantu (1977). A further 6 specimens from the island clearly conspecific with that putative species are here described. They necessitate a slight widening of the characters of the "species". Where relevant Matic and Darabantu's (1977) data are in parentheses.



Figures 1–7. *Cryptops basilewskyi.* **1** Cephalic plate and tergites 1 and 2 (specimen 1615/V) **2** Clypeus (specimen 6269/V) **3** Anterior margin of forcipular coxosternite (specimen 6269/V) **4** Terminal segments, ventral (specimen 1615/V) **5** Detail of coxopleuron **6** Pretarsus leg 2 (specimen 425/V). *Cryptops brignolii.* **7** Labrum after Matic, 1977. Scale line Figs 1, 4 = 0.5 mm, Figs 2, 5 = 0.5 mm, Figs 3, 6 = 0.1 mm.

Description. Maximum length 18 mm (14 mm). Colour: cephalic plate light orange, trunk light yellow with dark grey or black pigment on either side of heart and a narrow lateral strip on tergites 3–20, very little on 2 and 21. Pigmented areas also ventrally on 2–6 (Matic and Darabantu, fig.142 a, b, c).

Two basal articles of antenna with long and medium setae changing through 3 and 4 to dense short setae with basal whorl of medium setae on 5. Cephalic plate almost circular the posterior margin covered by tergite 1 (Fig. 1) (not covered by T1). Two very short anterior oblique sutures and short posterior paramedian sutures seen in one specimen only (anterior and posterior sutures present). Clypeus with 2 post-antennal setae, 3 in mid region except for 1615/V where there are 4. Prelabral setae 6. Specimen 6269/V with 2 post-antennal and 5 intermediate setae (Fig. 2).

Forcipular coxosternite very slightly curved on each side with 2 or 3 long to moderate setae (3+3), the innermost slightly further from the edge, and several small setae

just behind anterior margin on each side (Fig. 3). Poison gland calyx subspherical situated in anterior region of trochanteroprefemur.

Tergite 1 without sulci, T2 with weak paramedian sulci occupying posterior third to half of tergite, complete 3 or 4 to 20. Lateral crescentic sulci on 3 to 19 or 20. Paramedian sutures could not be seen clearly in cleared specimens. Sternites with median longitudinal sulcus from 2 to 19. Weak transverse sulci 2 to 19 or 20 (only a slightly curved transverse sulcus). Sternite 21 wider than long, posterior margin curved (Fig. 4).

Pore field occupying anterior 54 to 57% of coxopleuron, with 12 or 13 pores (5 to 6 in each field). Three to 6 minute setae in pore field in the 2 largest specimens (no setae), 5 to 6 posterior to the pore field and 5 to 8 on the posterior edge (Figs 4, 5).

Ultimate legs with fine setae except ventrally and posteriorly on the prefemur and ventrally on the femur where they are thicker. Without tubercles or spinous processes. Tibial saw teeth 6 or 8, tarsal 3 (6+4). Tarsal claw without pretarsal accessory spurs.

Legs 1 to 19 with fine setae and tarsus very weakly divided or not (uniarticulate in holotype, biarticulate in paratypes). With a single accessory spur about half length of claw (Fig. 6).

Remarks. *Cryptops basilewskyi* has only been recorded from St Helena. It is very similar to *C. nigropictus* Takakuwa, 1936 from Taiwan and the Ryuku Islands apart from the apparently the faint central longitudinal sulcus on tergites 1 and 2 in the latter. This I regard as trivial character and consider *C. basilewskyi* to be a junior subjective synonym of *C. nigropictus* (see p. 35).

Cryptops brignolii Matic, 1977

http://species-id.net/wiki/Cryptops_basilewskyi

Fig. 7

Cryptops brignolii Matic, 1977 Frag. Ent. 13: 25, fig. 3 A-F.

Description. (Matic's (1977) data, some deduced from his figures). Length 17 mm. Colour yellow. Cephalic plate with very short longitudinal sutures extending only a short way back from the bases of the antennae, without posterior paramedian sutures. (Lateral pieces of labrum sinuous ("fessurato") with a basal tooth (Fig. 7). Anterior margin of forcipular coxosternite with 5 submarginal setae on each side. Poison gland calyx club-shaped and situated in forcipular femur and tibia. Pore field, with 38 small pores and 6 setae, occupying anterior 75% of coxopleuron. Ultimate leg with 5 tibial and 2 tarsal saw teeth (Matic 1977, fig. 3 E shows three). Tarsi of legs 1–19 not divided.

Distribution. Turkey.

Remarks. *C. brignolii* is, according to Matic (1977), differentiated from *C. hortensis* by the structure of the labrum: this apparently unique character requires fur-

ther investigation. Matic's fig. 3F shows the coxopleural pore field with 6 setae but *C. hortensis* has a single seta in the pore field also no mention is made of ventral median longitudinal groove on the prefemur of ultimate leg which is one of the characters of the latter species. Zapparoli (1990a) records *C. brignolii* as a Turkish endemic and it is here retained. Examination of additional material is required to substantiate this and to establish its status.

***Cryptops campestris* Attems, 1952**

http://species-id.net/wiki/Cryptops_campestris
Figs 8–16

Cryptops hortensis campestris Attems, 1952 Annls Mus. R. Congo Belge Sér. 8vo, Sci. Zool. 18: 129, fig. 213.
Cryptops campestris: Dobroruka, 1968 Rev. Zool. Bot. Afr. 78: 212.

Material examined. NMW. Parts of four syntypes on two slides Inv. Nr. 2950 *Cryptops hortensis campestris*. Rwanda, Rugege Wald [Forét de Rugege, 2,000 m]. Slide 1. Cephalic plate, forcipules and anterior segments of three specimens. Slide 2. Cephalic plate, maxillae, forcipules and ultimate legs. There appear to be no complete specimens of this "subspecies" although Attems recorded it from five localities.

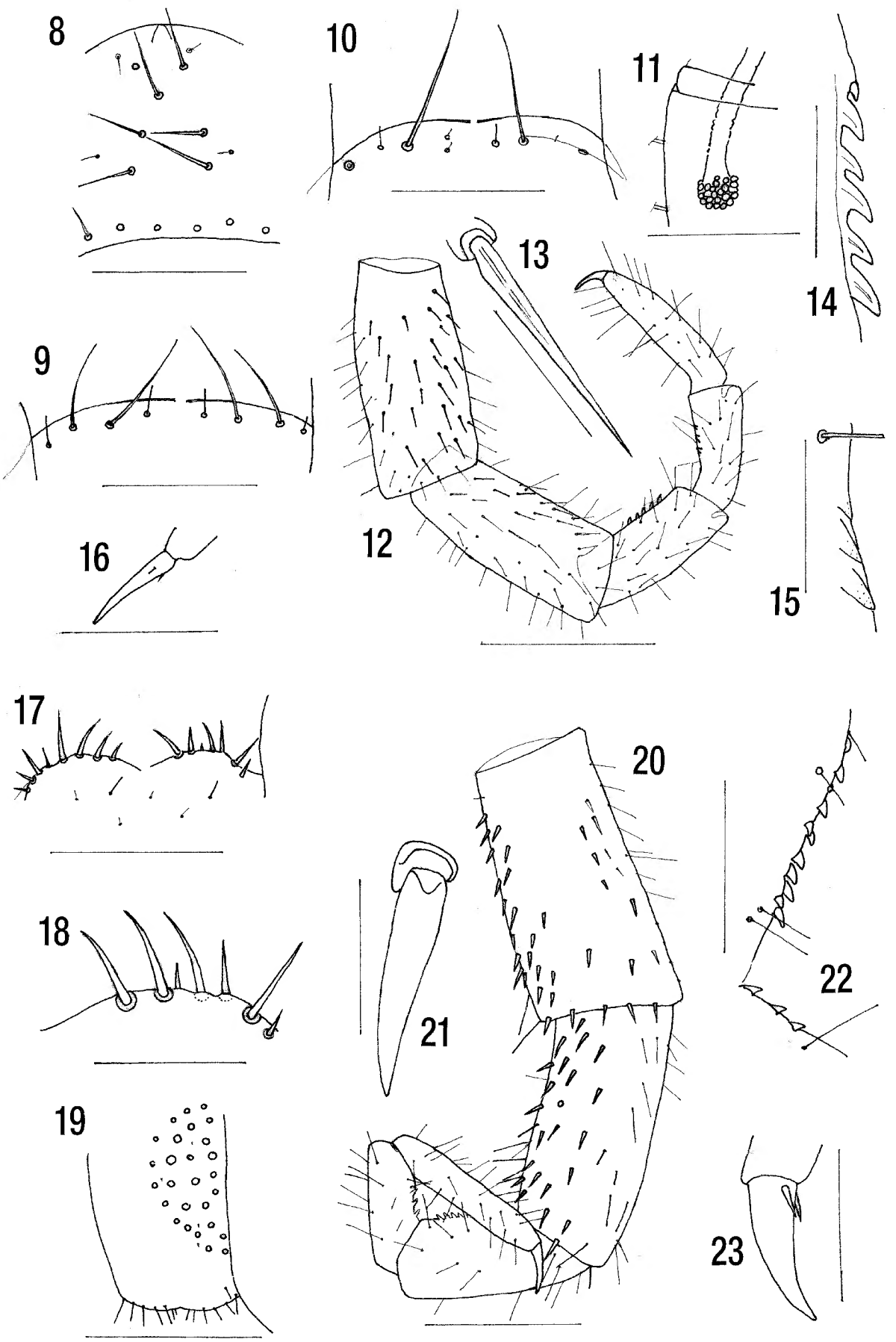
Description. (Attems' (1952) data in parentheses). (Length 12 mm. Colour ochre yellow). Antennal articles short, the basal 3 with some long setae, 3 with some shorter setae, 4 and subsequent with shorter setae and median whorl of long setae. (Head plate and tergite 1 without sutures, the head overlapped by tergite 1). Clypeus with 2+1+2+2 long and 2+2 minute setae (Fig. 8) or 2+1+2 long and 5 minute to small setae and 6 prelabral setae. Anterior wall of coxosternite almost straight, with 1 or 2 long fine setae and 2 or 3 small setae on each side (Figs 9, 10) (with 2+2 large and 2+2 or 2+3 small setae somewhat behind the wall). Poison gland calyx subspherical, situated in anterior region of forcipular trochanteroprefemur (Fig. 11).

(Paramedian sulci from tergite 6, lateral crescentic sulci from 4–19. Tergite 21 without a depression. Sternites with cross sulci).

(Coxopleural pore field reaches hind wall [of?], with some setae). Ultimate legs (Fig. 12) with fine setae on tibia and tarsi and dorsally on prefemur and femur, thicker ventrolaterally, ventrally and ventromedially on prefemur (Fig. 13) and less so ventrolaterally and ventromedially on femur (Fig. 13). Prefemur without median glabrous strip. Tibia with 5, tarsus 1 with 3 saw teeth (Figs 14, 15) (6+3). Legs with long fine setae, pretarsal accessory spurs small (Fig. 16).

Distribution. Rwanda; Democratic Republic of Congo.

Remarks. The species has been inadequately described there being no data on the shape of sternite 21 or the arrangement of coxopleural pores, but, as Dobroruka (1968) realised, it is clearly not a subspecies of *C. hortensis* which, in any case, would



Figures 8–23. *Cryptops campestris* syntypes. **8** Clypeus **9** Anterior margin of forcipular coxosternite (slide 1) **10** Anterior margin of forcipular coxosternite (slide 2) **11** Poison gland calyx (slide 2) **12** Ultimate leg (slide 2) **13** Ventromedial spine from ultimate prefemur **14** Tibial saw teeth ultimate leg **15** Tarsal saw teeth ultimate leg **16** Pretarsus leg 3 (slide 2). *Cryptops covertus* lectotype **17** Anterior margin of forcipular coxosternite **18** Detail of left half of forcipular coxosternite **19** Ultimate leg coxopleuron **20** Ultimate leg median **21** Spine-like seta from ultimate prefemur **22** Tibial and tarsal saw teeth ultimate leg **23** Pretarsus of leg 16. Scale lines = 0.1 mm except Figs 12, 19, 20 = 0.5 mm, Figs 17, 22 = 0.25 mm and Figs 13, 21 = 0.05 mm.

not make sense geographically. It may well be conspecific with *C. decoratus* or *C. melanotypus* but I currently regard it as a **nomen dubium.**

***Cryptops compositus* Chamberlin, 1952**

http://species-id.net/wiki/Cryptops_compositus

C. compositus Chamberlin, 1952 Rev. Fac. Sci. Univ. Istanbul 17: 189.
C. compositus: Zapparoli, 1990a In: Minelli A. (ed.) Proceedings of the 7th International Congress of Myriapodology. E. J. Brill, Leiden, p. 52.

Distribution. Turkey.

Remarks. Chamberlin gave only sketchy data viz. length: 20 mm, cephalic plate and tergite 1 without sutures, tergites with paramedian sutures. Pore field with up to 15 pores and extending to posterior margin of coxopleuron. Ultimate legs without spine-like setae or teeth; with 10 tibial and 4 tarsal saw teeth. Zapparoli (1990a) noted that the species is insufficiently described and its identity must be checked. It is here regarded as a nomen dubium**.**

***Cryptops covertus* Chamberlin, 1951**

http://species-id.net/wiki/Cryptops_covertus
Figs 17–23

C. covertus Chamberlin, 1951 Publ. Cult. Cia Diamant. Angola 10: 107.

Material examined. NMNH. Four "syntypes" *Cryptops covertus* Ch. ANG 817.2. [Dundo, Forest of Luachimo, Angola]. Specimen 1: 16 mm, is the best preserved specimen and corresponds most closely with Chamberlin's description. It is here designated the lectotype, the identity of the other specimens being in doubt. They are: specimen 2: 14 mm (ultimate legs missing), specimen 3 (posterior half only), specimen 4: 9 mm. Specimens 2 and 3 are clearly other species. Specimen 4 was not examined in detail. Chamberlin examined 9 specimens in all.

Diagnosis. Length: 16 mm. Without dark subcuticular pigment. Cephalic plate without sutures. Anterior margin of forcipular coxosternite bilobed with 5 or 6 stout marginal setae on each side. Poison gland calyx subspherical. Coxopleural pore field, with about 25 pores and several small setae, occupying no more than anterior 74% of coxopleuron. Ultimate legs with 10 tibial and 3 tarsal saw teeth. Legs 1–20 with short pretarsal accessory spurs.

Description of lectotype. (Chamberlin's (1951) data in parentheses where relevant).

Length 16 mm. Light orange, without subcuticular pigment but with dark stellate bodies beneath the cuticle, presumably fungal (colour light brown, the cephalic plate and last legs a brighter yellow).

Each antenna of 7 long articles probably as the result of elongation after articles lost as suggested by Lewis (2000). Cephalic plate without sutures except for slight traces on posterior margin. Tergite 1 without sutures and overlying cephalic plate. Anterior margin of forcipular coxosternite bilobed, with 6+5 stout larger and 2 +2 smaller marginal setae (Figs 17, 18) (marginal setae 5+5 or 6+6). Poison gland calyx subspherical.

Tergites with paramedian sulci from 3, lateral crescentic sulci from 4 but with traces on tergites 2 and 3. Sternite cruciform sulci not observed (sulci forming a cross in the middle).

Coxopleuron with about 25 pores of varying size (Fig. 19), the pore field, with several small spine like setae, occupying the anterior 74% of coxopleuron. With 6 setae on the posterior margin and a single seta just anterior to them. Prefemur of ultimate leg (Fig. 20) with fine setae dorsally and dorsolaterally, with spine-like setae (Fig. 21) ventrolaterally, ventrally and medially except for a longitudinal glabrous area medially. Femur with fine setae dorsally, spine-like setae (Fig. 21) and a few fine setae ventrally and spine like setae ventromedially. Tibia and tarsus 1 and 2 with fine setae. Right tibia with 10 saw teeth, comprising 8 and a second row of 2, tarsus with 3 saw teeth (Fig. 22) (Tibia with 4 stout teeth in series below [meaning?], the first tarsal joint with 2. Tibia with a low obtuse tooth on each side at distal end above). Legs 1–19 with undivided tarsi and fine setae. Pretarsi of legs 1–20 with short accessory spurs (Fig. 23).

Distribution. Angola.

Remarks. Chamberlin's description of the arrangement of saw teeth on the ultimate legs differs markedly from that of the lectotype which otherwise compares well with his brief description. Further material is required to resolve this difference.

Cryptops daszaki Lewis, 2002

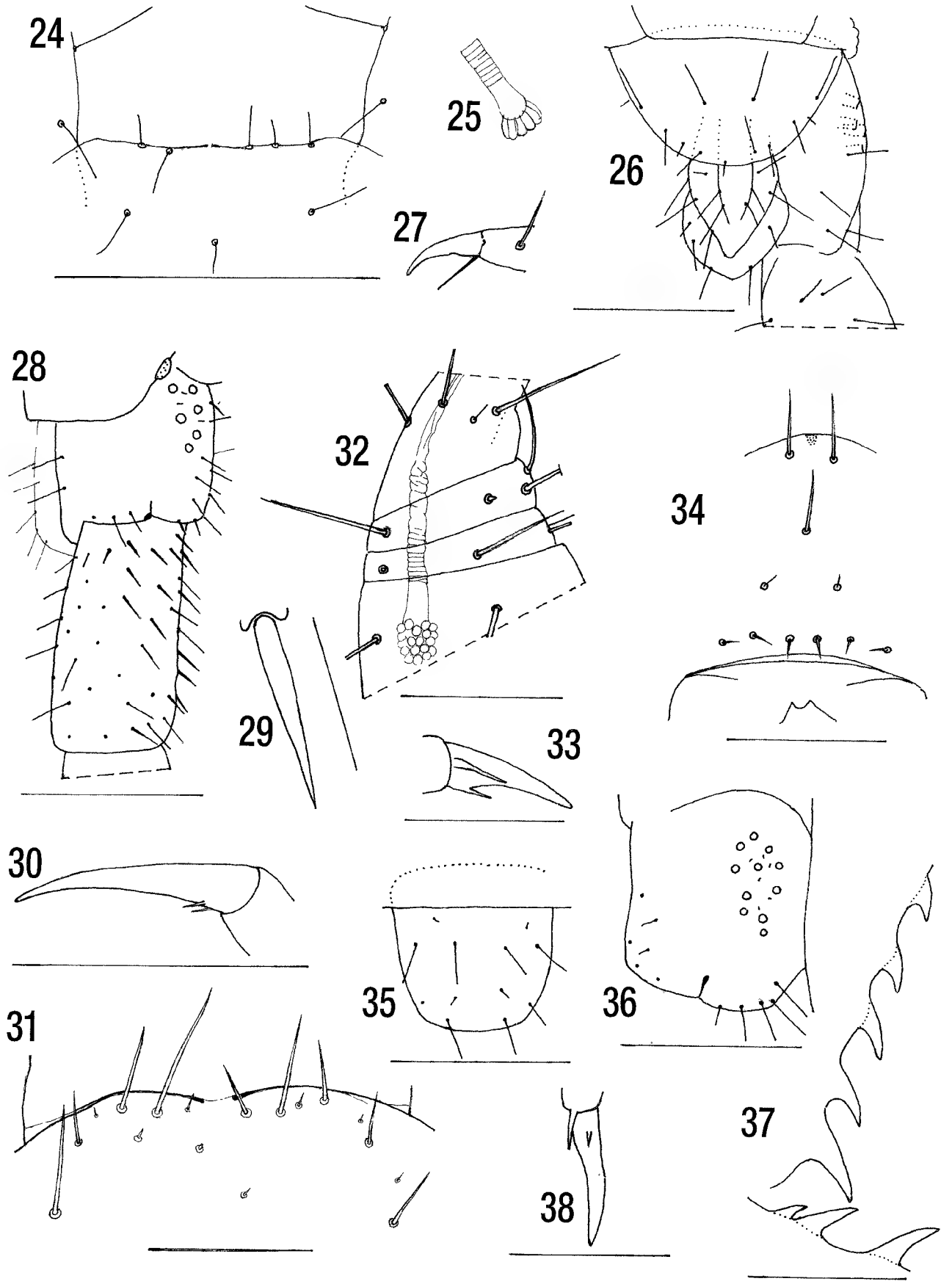
http://species-id.net/wiki/Cryptops_daszaki
Figs 24–27

C. daszaki Lewis, 2002 J. Nat. Hist 36: 99, figs 53–64.

Diagnosis. Length: 4–7 mm. Without dark subcutaneous pigment. Cephalic plate without sutures. Tergite paramedian sutures complete from 3. Anterior margin of forcipular coxosternite slightly concave or straight with 2 or 3 fine setae on or almost on anterior margin. (Fig. 24). Poison gland calyx with very few gland cells, situated in anterior part of forcipular trochanteroprefemur (Fig. 25). Sternite almost semicircular (Fig. 26). Pore field occupying 50% of coxopleuron and with 5 or 6 pores. Ultimate leg with 3 tibial and 2 tarsal saw teeth. Pretarsi of legs 1–20 with a single long accessory spur. (Fig. 27).

Distribution. Île aux Aigrettes, Mauritius (Indian Ocean).

Remarks. Some specimens, at least, of this very small species were mature and Lewis (2002) suggested that the life cycle involved relatively few stadia.



Figures 24–38. *Cryptops daszaki* holotype after Lewis 2002. **24** Anterior margin of forcipular coxosternite **25** Poison gland calyx **26** Terminal segments ventral **27** Pretarsus leg 11. *Cryptops decoratus* holotype. **28** Left coxopleuron and prefemur of ultimate leg dorsolateral **29** Seta from ultimate leg prefemur **30** Pretarsus of an ambulatory leg. "*Cryptops decoratus*" **31** Anterior margin of forcipular coxosternite (Round Island Mauritius specimen 2). **32** Poison gland (Round Island after Lewis 2002) **33** Pretarsus leg 12 (Round Island specimen 3) **34** Clypeus (Aride, Seychelles, after Lewis 2007b) **35** Sternite 21 (Aride, after Lewis 2007b) **36** Ultimate leg coxopleuron (Aride specimen 2) **37** Tibial and tarsal saw teeth ultimate leg (Silhouette, after Lewis 2007b) **38** Pretarsus, leg mid body region (Silhouette specimen L2). Scale lines = 0.1 mm except Fig. 28 = 0.5 mm, Figs 35, 36 = 0.25 mm, Figs 29, 30, 32, 38 = 0.05 mm.

***Cryptops decoratus* Lawrence, 1960**
http://species-id.net/wiki/Cryptops_decoratus
Figs 28–30

C. decoratus Lawrence, 1960 Faune de Madagascar 12. Myriapodes Chilopodes, p. 84, fig. 25 c, d, 26 a-d.
C. penicillatus Lawrence, 1960 Faune de Madagascar 12. Myriapodes Chilopodes, p. 76, fig. 22 a-d. **Syn. n.**
nec *C. decoratus*: Lewis, 2002 J. Nat. Hist. 36: 95, figs 27–35.
nec *C. decoratus*: Lewis, 2007b Phelsuma 15: 18, figs 17–25.
nec *C. decoratus*: Lewis, 2010a In: Gerlach J & Marusik Y (eds) The Arachnida and Myriapoda of the Seychelles Islands, p. 283, figs 14–15.

Material examined. MNHN. Holotype [Madagascar Sambirano]. Mt. Tsaratanana [Andilabe] 2200 m. II 51 RP [R. Paulian, févr, 1951]. (Forcipules are missing).

Diagnosis. (Based on *C. decoratus* sensu Lawrence (1960) and *C. penicillatus*. See below for description of *C. penicillatus*). Length: 14–16.5 mm. With or without dark subcuticular pigment. Cephalic plate and tergite 1 without sutures. Poison gland calyx spherical, situated in anterior region of forcipular trochanteroprefemur. Anterior margin of forcipular coxosternite almost straight with 1+2 or 2+2 long submarginal setae on each side. Sternites with wide longitudinal sulcus, very narrow transverse sulcus. Posterior margin of sternite 21 straight or slightly concave. Pore field widely separated from caudal margin of coxopleuron, with 6–9 pores and 3–6 minute setae; 5–9 setae between it and the coxopleural margin. Ultimate legs with 4–5 tibial and 2–4 tarsal saw teeth. Pretarsal accessory spurs of legs 1–20 short.

Description of holotype. (Additional data from Lawrence (1960) in parentheses).

Length 14 mm. Colour after preservation for 48 years uniform greyish orange (yellow with green black pigment forming a central double band and along lateral margins from tergite 2).

Cephalic plate without sutures. Tergite 1 without sutures and overlying posterior margin of cephalic plate. (Anterior margin of coxosternite almost straight with 1+2 long submarginal and 1+2 shorter setae on each side. Poison gland calyx spherical, situated in anterior part of forcipular trochanteroprefemur [these data from Lawrence, 1960, fig. 25 c]).

Tergites with median ridge from 3 (5–20). Paramedian sutures from 5 ("sillons" from 5 or 6–20). Lateral crescentic sulci from 3–20 (5–19). Tergite 21 with posterior median depression. Sternites with cruciform sulci, the longitudinal sulcus longer and wider than the narrow lateral arms (the longitudinal sulcus present on all segments, the transverse weak and absent on anterior half of trunk). (Sternite 21 with posterior margin straight or slightly concave). Sternite 21 was not figured by Lawrence (1960) and shape could not be seen in the holotype.

Coxopleuron with 8 large pores (7–9) occupying anterior 50% of coxopleuron and with at least 3 minute setae in pore field; 3 or 4 fine setae on posterior margin and up to 5 between this and the pore field (several moderately long setae between the pores)

(Fig. 28). Prefemur of ultimate legs with long fine setae dorsally, but thicker setae on lateral, ventral and medial surfaces (Fig. 29) without medial longitudinal glabrous area. Femur with long fine setae, those of medial surface thicker. (End legs with numerous strong setae). Tibia with 4, tarsus 1 with 2 saw teeth (5+2/3). Legs 1–19 with fine setae, tarsi undivided, pretarsal accessory spurs very short (Fig. 30).

Distribution. Madagascar.

Remarks. *Cryptops penicillatus* (from Madagascar Centre and Madagascar Sambirano) is very similar to *C. decoratus* (from Madagascar Sambirano, Madagascar Nord and Madagascar Est). These are distinguished in Lawrence's (1960) key as follows:

– Colour uniform yellow: transverse sulci of sternites stronger than the longitudinal sulci ..... ***penicillatus***

– Greenish black pattern on dorsal surface and sometimes also on the pleural and sternites; longitudinal sulci of sternites clearly more marked than the transverse sulci ..... ***decoratus***

His key, however, does not tally with the text which states that *C. penicillatus* is without transverse sulci on the sternites and *C. decoratus* the transverse sulci are weak. These do not tally with my observations on the two holotypes which both have a broad longitudinal and a narrow transverse sulcus and thus do not differentiate the species. I regard the two as conspecific *C. penicillatus* being a *C. decoratus* lacking dark subcuticular pigment.

NB. Lawrence (1960) noted variation in the intensity of pigmentation of his specimens of *C. decoratus*, the example from Navana being more pigmented than the others. Both "species" were described in the same work by Lawrence (1960). In such a case the first reviewer is to fix precedence (ICZN Article 24.2.2). *Cryptops decoratus* is here selected as the senior synonym being the more common form (recorded from 7 localities as compared to 2 for *C. penicillatus*).

Other material hitherto assigned to *C. decoratus*

Figs 31–38

Lewis (2002) assigned specimens from Mauritius and the Seychelles (Lewis 2007b, 2010a) to *C. decoratus*. The material is here reconsidered.

Description of Mauritius and Seychelles material. (The latter in parentheses where appropriate). Length: 10–15 (7.5–14) mm. With dark subcuticular pigment, though very little in specimens from Serpent Island as compared to those from Round Island (only 5 of 15 specimens from the Seychelles had black or grey subcuticular pigmentation the remainder showed no dark colouration). Cephalic plate and T1 without sutures. Clypeus with 2+1+2+6 (Fig. 34) or 2+1+2+2+6 setae. Anterior margin of forcipular coxosternite slightly curved on each side with 2+2 or 2+3 or 3+3 long submarginal setae (Fig. 31) (2+2). Poison gland calyx subspherical, situated in anterior region of forcipular trochanteroprefemur (Fig. 32). Posterior margin of sternite 21 straight or slightly curved (mostly with rounded

posterior margin, rarely straight) (Fig. 35). Pore field occupying anterior 60–70% of coxopleuron, with 7–16 pores (8–14), 5–8 small setae in the pore field (4–6) and 1–3(4) between it and the coxopleural margin ((0)1–2) (Fig. 36). Ultimate leg prefemora with broad medial longitudinal glabrous area with 5–7 tibial and 3–4 tarsal saw teeth (Fig. 37). Lewis (2002) described the setae on the anterior, ventral and posterior surfaces of theprefemur of ultimate legs as "spine-like" but his Fig. 41 shows them to be just a little thickened.

Pretarsal accessory spurs of legs 1–20, the posterior 40% length of pretarsus the anterior slightly shorter but sometimes only 12% of the pretarsal length (Fig. 33). The accessory spurs short in Seychelles material, the second very short and easily overlooked (Fig. 38).

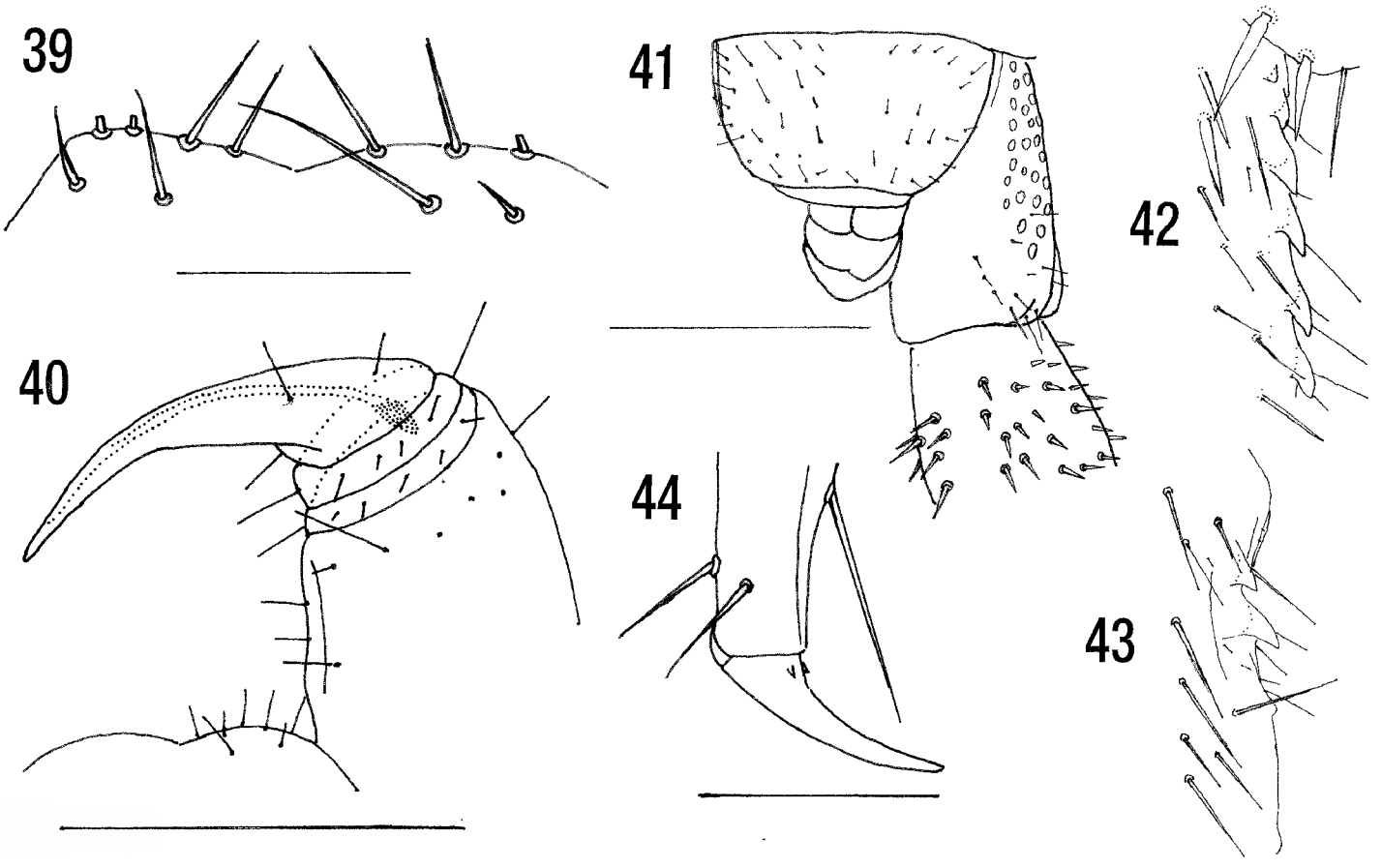
Remarks. The specimens from Mauritius and the Seychelles may be differentiated from Madagascan *C. decoratus* by the possession of the glabrous area on the ultimate prefemur and lower number of setae posterior to the coxopleural pore fields. These differences are relatively minor but consistent. They are clearly very closely related to *C. melanotypus* Chamberlin, 1921 and are here regarded as belonging to that species although it is known only from a single specimen (see p. 3).

***Cryptops hortensis hortensis* (Donovan, 1810)**
http://species-id.net/wiki/Cryptops_hortensis_hortensis
Figs 39–44

Scolopendra hortensis Donovan, 1810 The Natural History of British Insects 14: 23.
C. hortensis var. *pseudopunctatus* Verhoeff, 1901 Nova Acta Acad. Caesar. Leop. Carol. 77: 431.
C. hortensis pauciporus Brölemann, 1908 Bull. Soc hist. nat. Toulouse 41: 65.
C. aenariensis Verhoeff, 1943 Zool. Anz. 142:76, figs 7–10.
C. longipes Goux, 1950 Bull. Mens. Soc. Linn. Lyon 19: 195.

Diagnosis. Length: about 20 mm. Without dark subcutaneous pigment. Cephalic plate with very short anterior longitudinal sutures extending only a short way back from the bases of the antennae, without posterior paramedian sutures. Clypeus with a pair of postantennal setae, 4–12 somewhat irregular clypeals and 6–12 prelabrals. Labral sidepieces not notched. Anterior margin of forcipular coxosternite barely protuberant, with about four setae on each side on the anterior margin (Fig. 39). Poison gland calyx club-like (Fig. 40), somewhat variable in shape, situated mainly in the forcipular tibia. Posterior margin of sternite 21 slightly concave. Coxopleural pore field with about 30 pores, not extending to posterior margin, usually containing a single seta (Fig. 41), sometimes without. Prefemur of ultimate leg with ventral median longitudinal groove. With 5–9 tibial (Fig. 42) and 2–4 tarsal saw teeth (Fig. 43). Pretarsal accessory spurs of legs 1–20 very small (Fig. 44).

Distribution. Azores, Madeira, Canary Islands, Morocco, Iberia, France (incl. Corsica), Ireland, United Kingdom, Denmark, Norway, Netherlands, Germany, Poland, Czech Republic, Slovak Republic, Hungary, Italy (incl. Sardinia and Sic-



Figures 39–44. *Cryptops hortensis hortensis.* **39** Anterior margin of forcipular coxostrernum (St Helena specimen 1) **40** Left forcipule and coxosternite (La Guardia, Spain specimen C17) **41** Terminal segments, left coxopleuron and part of left prefemur of ultimate leg (Bournemouth, U.K.) **42** Tibial saw teeth of ultimate leg (after Brolemann 1930) **43** Tarsal saw teeth of ultimate leg (after Brolemann 1930) **44** Pretarsus leg 12 (Bournemouth, U.K.). Scale lines = 0.5 mm except Figs 39 = 0.1 mm, Fig. 44 = 0.05 mm.

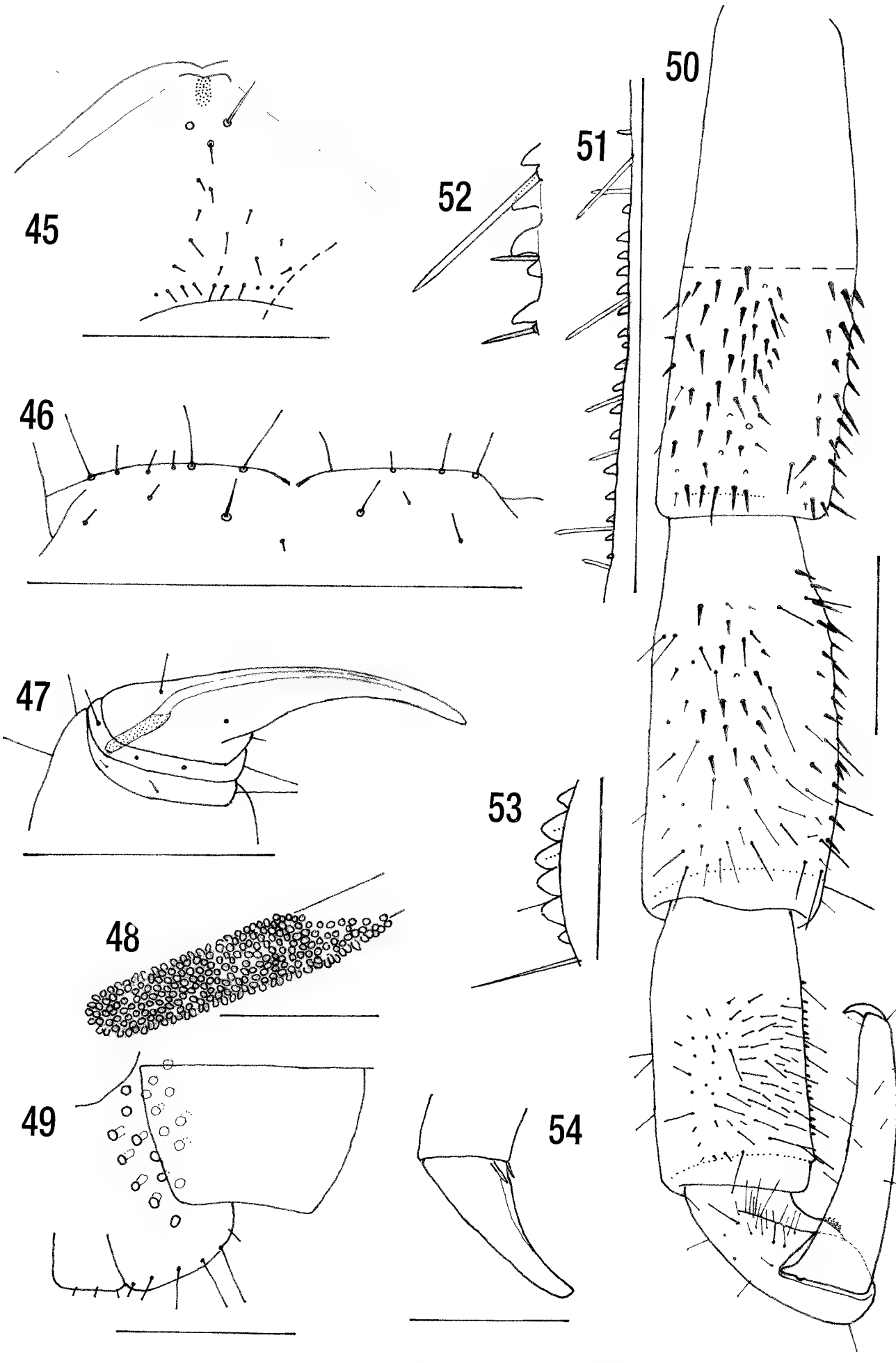
ily), Switzerland, Austria, Slovenia, Croatia, Bosnia-Herzegovina, Montenegro, FYR Macedonia, Albania, mainland and insular Greece (incl. Crete), Bulgaria, Romania, N-Turkey, Ukraine, European Russia, Georgia, Armenia, Azerbaijan, Turkmenistan, Tajikistan, Uzbekistan; introduced into United States, Hawaii, Canada, St. Helena; Australia (Tasmania), Christmas Island. Synanthropic in Scandinavia (Sweden, Finland).

Remarks. *C. hortensis pauciporus* Brolemann, 1908 has no seta in the pore field. Pichler (1987) under *Cryptops* cf. *hortensis* described specimens from 1,000–1,300 m in Nordtirol, Austria, without the pronounced longitudinal ventral groove in ultimate prefemur seen in *C. hortensis* and suggested that further sampling would be required to clarify its status.

Cryptops hortensis atlantis **Pocock, 1891**

http://species-id.net/wiki/Cryptops_hortensis_atlantis
Figs 45–54

C. atlantis Pocock, 1891 Ann. Mag. Nat. Hist [6] 8: 155, Pl. 12, fig. 12.



Figures 45–54. *Cryptops hortensis atlantis* holotype. **45** Clypeus **46** Anterior margin of forcipular coxosternite **47** Right forcipule **48** Detail of poison gland calyx **49** Sternite 21 and right coxopleuron (sternite setae omitted) **50** Left ultimate leg **51** Ultimate leg tibial saw teeth **52** Detail of saw teeth and setae **53** Ultimate leg tarsal saw teeth **54** Pretarsus of ambulatory leg. Scale lines= 0.5 mm except Figs 48, 51, 53, 54 = 0.1 mm.

C. hortensis atlantis: Kraepelin, 1903 Mitt. Naturhist. Mus. Hamburg 20: 57.

Material examined. BMNH. Holotype. Madeira: Grant, W. R. O. BMNH(E) # 20001 Chilo. 1891.3.8.10. Original label missing.

Diagnosis. Length 20.5 mm. Without dark subcutaneous pigment. Cephalic plate with very short longitudinal sutures extending only a short way back from the bases of the antennae. Clypeus with a pair of post-antennal setae, 12 somewhat irregular clypeals and 9 prelabrals. Labral sidepieces not notched. Anterior margin of forcipular coxosternite barely protuberant, with 4 to 6 fine setae on each side on the anterior margin. Poison gland calyx cylindrical, situated mainly in posterior part of the tarsungulum. Posterior margin of sternite 21 slightly concave. Coxopleural pore field not extending to posterior margin, without setae. Prefemur of ultimate leg with ventral median longitudinal groove. Tibia with 15–17 well separated minute saw teeth, tarsus with 5–6 close set teeth. Pretarsal accessory spurs of legs 1–20 very small.

Description. (Pocock's (1891) data in parentheses where relevant).

Male (contains 3 spermatophores). Length 20.5 mm (21.5 mm). Colour reddish brown (antennae, head, first two and last two somites and anal legs ochraceous; rest of legs testaceous: rest of somites ochraceo-fuscous).

Antennnal articles 15[r]-12[d], article 1 with long and medium setae, 2 with in addition a few short setae, 3 intermediate, 4 with small setae and basal whorl of long and medium setae. Cephalic plate with extremely short weak oblique anterior paramedian sutures at bases of antennae. Tergite 1 overlying posterior margin of cephalic plate.

Clypeus with a pair of post-antennal setae, about 12 clypeals of varying size approximately forming an elongated triangle (Fig. 45). A row of 9 prelabral setae. Labrum not visible.

Anterior wall of forcipular coxosternite slightly convex on each side with 6 + 4 fine marginal setae (Fig. 46). Poison gland calyx situated in tibia and posterior part of tarsungulum, cylindrical and of moderate length (Figs 47, 48).

Tergite sutures not seen, paramedian sutures difficult to observe in this darkly pigmented specimen but apparently wanting on tergites 2 and 3, occupying anterior 75% on tergite 4, complete on 14, almost complete on 19 and 20. Very weak arcuate sutures on tergites 4 to 8. (The first three wholly without sulci, the fourth obsoletely sulcate posteriorly and laterally, the rest, except the last, with four sulci; two internal complete, two external incomplete and oblique, the oblique sulci almost obsolete on the seventeenth to twentieth tergites). Pocock's (1891) terms internal complete and external incomplete and oblique sulci clearly referred to the paramedian and lateral crescentic sulci.

Detail of sternites 1 to 20 not observed (medially and longitudinally sulcate, the transverse sulcus scarcely perceptible). Sternite 21 with sides converging posteriorly and hind margin slightly concave (Fig. 49). Coxopleuron with relatively few pores (19–20) occupying anterior 70% of pore field. No setae in pore field and none between pore field and posterior margin which bears 6 or 7 setae.

Ultimate leg (Fig. 50) prefemur with spinous setae on ventral and posterior (median) surface, dorsal and lateral surfaces with a few setae. A glabrous ventromedial

groove. Femur with fewer spinous setae ventrally and medially but more fine setae especially distally. A poorly defined glabrous ventromedian strip. Tibia flattened dorsally, and in distal half with a few short fine setae dorsally and laterally and dense fine setae ventrally and medially: with 15 or 17 well-separated minute saw teeth on inferior edge of flattened medial surface (Fig. 51). The attendant setae parallel-sided and pointed (Fig. 52). Tarsus 1 bulbous distally with dense medium to long setae, with 5 or 6 close set saw teeth (Fig. 53), larger than those of the tibia and set on a pronounced hump. Tarsus 2 with a few scattered setae. Pretarsal claw simple, Pretarsal accessory spurs of legs 1–20 small (Fig. 54). The twentieth pair of this male with dense fine setae ventrally on prefemur, femur and tibia.

Distribution. Madeira and possibly the Azores and the Canary Is.

Remarks. Kraepelin (1903) stated that *C. atlantis* was differentiated from *C. hortensis* only by the large number of saw teeth on the femora of the ultimate legs and stated that in correspondence Pocock (1891) had said that he considered it only a variety of *C. hortensis*. Kraepelin (1903) accordingly listed it as *C. hortensis atlantis*. Confusingly, he stated that he had before him specimens from the Azores and the Canaries (presumably of what he considered *atlantis*) with 6–7 tibial and 1–3 tarsal saw teeth. He suggested that further work might allow the identification of geographically separated forms. Attems (1930) may have been referring to Kraepelin's (1903) statement when he gave the distribution of *C. hortensis atlantis* as Madeira, Azores, Canaria, Tenerife. I regard these records as uncertain. Material is required from the Azores and the Canaries. Attems (1930) noted that there was also the var. *hortensis* from S. Miguel, Azores, with 5+3 saw teeth.

The differences in the number and type of the saw teeth between *C. hortensis atlantis* and *C. hortensis* are major and I consider them more than sufficient to return *C. atlantis* to full specific status. It is worth noting that Lewis (2010b) suggested that the characteristics of the saw teeth of the ultimate legs in *Cryptops* may allow species recognition before paring takes place.

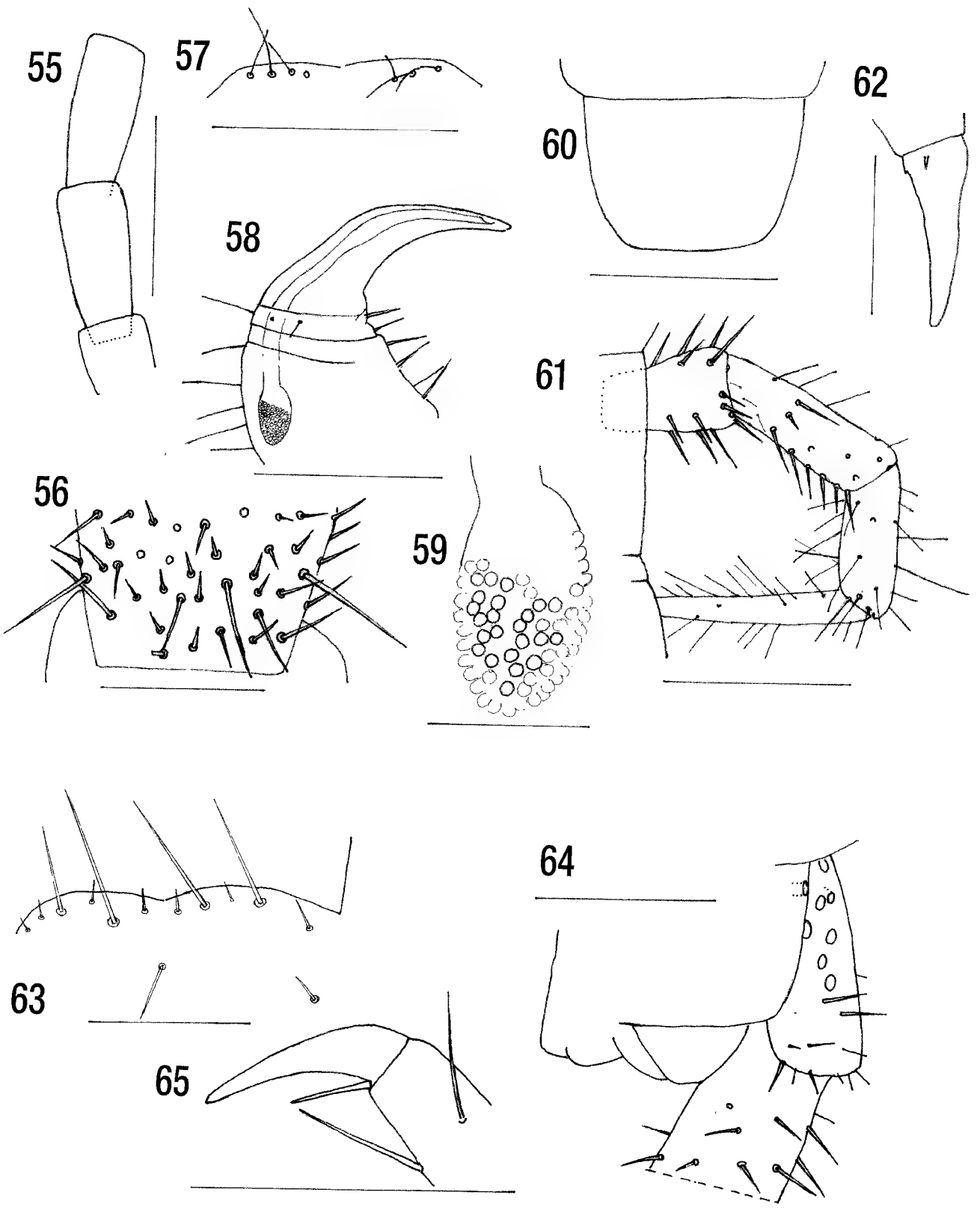
***Cryptops inermipes* Pocock, 1888**

http://species-id.net/wiki/Cryptops_inermipes
Figs 55–62

C. inermipes Pocock, 1888 Proc. Zool. Soc., Lond. 38: 556, fig. 1.

Material examined. BMNH. Holotype labelled *Cryptops* (*Cryptops*) *inermipes* Pocock type Indian Ocean: Xmas Island Lister J J. 88.96 HMS 'Egeria' BMNH(E) 200007 Chilo 1888.96.

Diagnosis. Length 27 mm. Without dark subcutaneous pigment. Cephalic plate without sutures. Anterior margin of forcipular coxosternite barely protuberant, with three or four fine submarginal setae on each side on the anterior margin. Poison gland calyx ovoid, situated mainly in the anterior part of the trochanteroprefemur. Posterior



Figures 55–65. *Cryptops inermipes* holotype. **55** Antennal articles 10, 11 (setae omitted) **56** Detail of proximal region of antennal article 10 **57** Anterior margin of forcipular coxosternite **58** Right forcipule **59** Detail of poison gland calyx **60** Sternite 21 **61** Leg 2 **62** Pretarsus leg 18. *Cryptops kalobensis.* **63** Anterior margin of forcipular coxosternite (paratype specimen 2) **64** Coxopleuron and parts of sternite 21 and ultimate leg prefemur (paratype specimen 1) **65** Pretarsus leg 9 (paratype specimen 3). Scale lines = 0.5 mm except Fig. 64 = 0.25 and Figs 56, 59, 61, 63–65 = 0.1 mm.

margin of sternite 21 slightly curved. Coxopleural pore field occupying anterior 75% of coxopleuron, with about 70 pores. Ultimate tibia and tarsus without saw teeth. Pretarsal accessory spurs of legs 1–20 minute.

Description. (Pocock's (1888) data in parentheses where relevant).

Length 27 mm. Colour: brownish orange, cephalic plate brown. Antennal articles 16 [d]+16 [d], very long. Article 10 twice as long as wide (Fig. 55) with an irregular whorl of long basal setae (Fig. 56).

Cephalic plate without sutures, overlain by first tergite. Forcipular coxosternite slightly convex on each side with 4+3 fine submarginal setae (Fig. 57). Calyx of forcipular poison gland ovoid and situated in the anterior part of the trochanteroprefemur (Figs 58, 59).

Paramedian and crescentic sulci clearly visible from tergite 3 (second [tergite] with two shallow sulci; the rest, with the exception of the last, bearing four sulci). Sternite sulci not seen but the transverse apodeme is clear (each, the first excepted, with a median longitudinal sulcus, and most of them with a median transverse sulcus, the distinctness of this latter sulcus is variable, and it almost disappears in the posterior region of the body).

Sternite 21 with sides converging posteriorly with a slightly convex posterior margin (Fig. 60). Coxopleuron with about 70 pores and occupying approximately anterior 75% of the pore field. With two setae in the pore field, one behind and 6 on the posterior margin.

Ultimate legs now missing (denticles absent upon the under surface of the tibial and proximal tarsal segments of the anal legs). Twentieth pair of legs now missing. Ambulatory legs (Fig. 61) with undivided tarsi (legs, all that remain, remarkably hirsute but none of the segments spiny.). Pretarsal accessory spurs minute (Fig. 62).

Distribution. Christmas Island (Indian Ocean).

Remarks. The lack of saw teeth on the ultimate legs would appear to be an extremely rare mutation. The condition has not been reported from any other species in the genus. Unfortunately the fact that the ultimate legs are now missing does not allow confirmation of the condition. It is possible that Pocock (1888) mistook the twentieth for the ultimate pair of legs. The description provided here should allow confirmation of this when further specimens from Christmas Island become available.

Cryptops kalobensis Goffinet, 1971

http://species-id.net/wiki/Cryptops_kalobensis
Figs 63–65

C. kalobensis Goffinet, 1971 Rev. Zool. Bot. Afr. 83: 51, figs 1–3.

Material examined. MRAC. Three paratypes 9, 11 and 12 mm. Det G. Goffinet 1970 Congo: Katanga, Chute Kaloba, rivière Lofoi, base du plateau des Kundulungu [alt 1,070 m (Freson, R.). Réf. nº CM 1661]. 2.xi.1968. R.G. Mus. Afr. Centr. 13.135

Description. (Goffinet's (1971) data in parentheses where relevant). Length 9–12 mm. (With brown subcuticular pigment). Cephalic plate without sutures. Clypeus with 2 pairs of post-antennal setae and 3 intermediate setae forming an inverted triangle in front of a row of 6 prelabral setae. Anterior margin of forcipular coxosternite

feebly rounded on each side with 2 robust submarginal setae alternating with 2 or 3 small setae (Fig. 63). (Poison gland calyx subspherical situated in anterior region of forcipular trochanteroprefemur. Paramedian sutures incomplete on tergites 4 and 5 complete from 6). Posterior margin of sternite 21 straight (broadly rounded). Pore field occupying anterior 55 % of coxopleuron (with 6–13, but usually 8–11 pores) and without setae. Three setae along posterior margin of coxopleuron and 5 between pore field and margin (Fig. 64). (Ultimate leg with lanceolate setae ventrally and laterally and with 5–6 tibial and (2) 3 tarsal saw teeth). Pretarsi of legs 1–20 each with a single long accessory spur 47% of length of pretarsus (Fig. 65).

Remarks. I regard *C. kalobensis*, from the Democratic Republic of Congo, as conspecific with *C. nigropictus* from Taiwan and the Ryuku Islands of which it is a junior subjective synonym (see p. 35).

Cryptops lobatus Verhoeff, 1931

http://species-id.net/wiki/Cryptops_lobatus
Figs 66, 67

C. lobatus Verhoeff, 1931 Zool. Jb. (Syst.) 62: 280, Table 3, figs 8, 9.
C. lobatus: Iorio & Geoffroy, 2008 Riviéra Scientifique 91: 84, figs 4a, 6b.

Diagnosis. (Based on data in Verhoeff 1931 and Iorio and Geoffroy 2008). Length 10–13 mm. Without dark subcuticular pigment. Cephalic plate with incomplete paramedian sutures. Labral sidepieces not notched (unidentate labrum). Anterior margin of forcipular coxosternite produced into two elongated lobes separated by a deep incision. Forcipular tarsungulum short, the trochanteroprefemur with 3 or 4 stout setae on its medial surface (Fig. 66). Poison gland calyx elongated, tubular, reaching two thirds of the way down the forcipular trochanteroprefemur. Coxopleural pore field with about 18 pores occupying only anterior 50 % of coxopleuron (Fig. 67) without setae in pore field. With 6–10 tibial and 4–6 tarsal saw teeth.

Distribution. Southern France, Italy (Liguria).

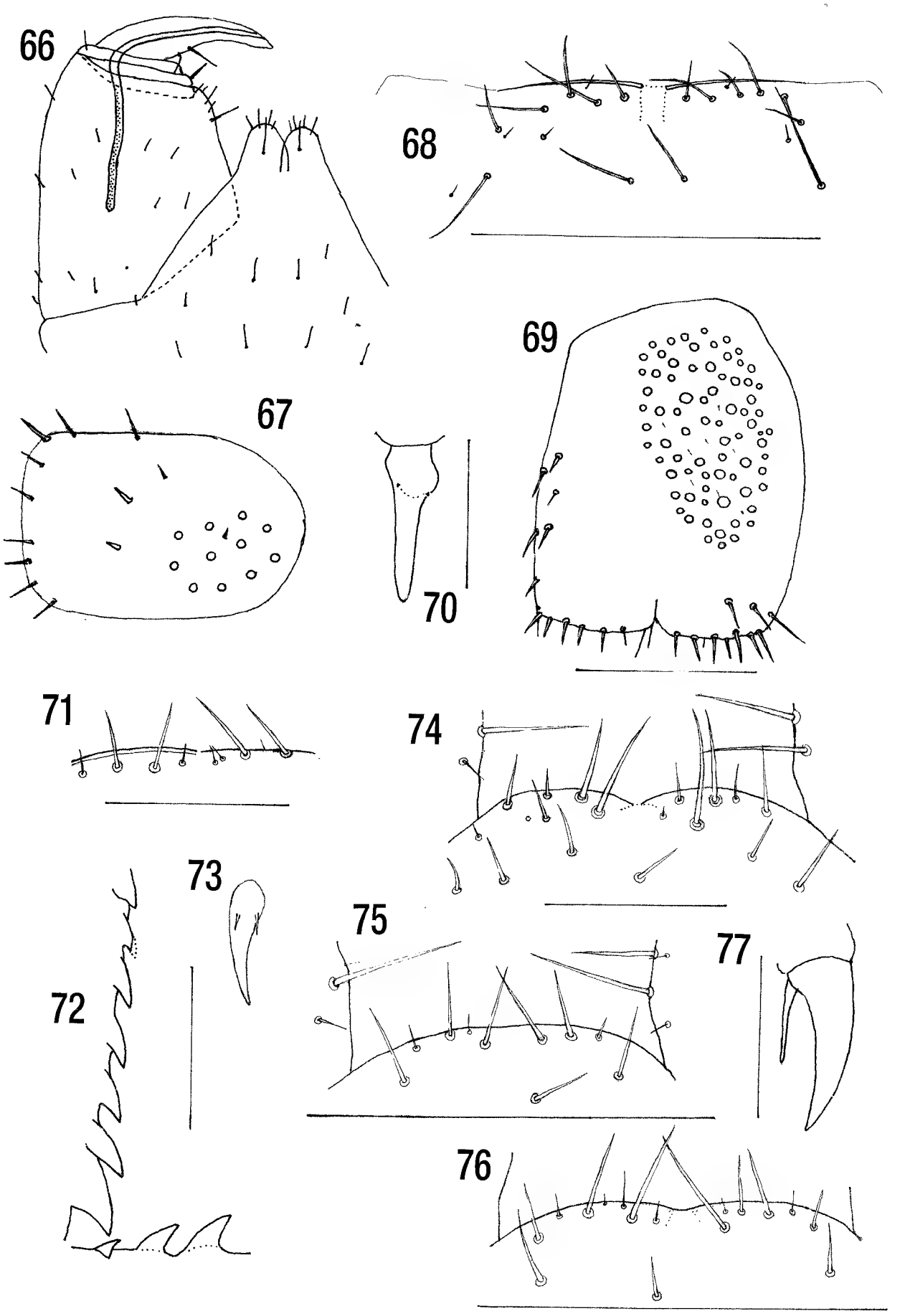
Cryptops mauritianus Verhoeff, 1939

http://species-id.net/wiki/Cryptops_mauritianus
Figs 68–70

C. mauritianus Verhoeff, 1939 Zool. Jb. (Syst.) 72: 94, Table 5, figs 23–26.
C. mauritianus: Lewis, 2002 J. Nat Hist. 36: 91, figs 22–35.

Diagnosis. Length: 15–32 mm. With dark subcuticular pigment.

Cephalic plate with or without very short posterior paramedian sutures. Anterior margin of forcipular coxosternite almost straight with (3) 4 or 5 long submarginal setae on each



Figures 66–77. *Cryptops lobatus*. **66** Forcipular coxosternite and right forcipule (after Verhoeff 1931) **67** Ultimate leg coxopleuron (after Iorio and Geoffroy 2008). *Cryptops mauritianus*. **68** Anterior margin of forcipular coxosternite (after Lewis 2002) **69** Left coxopleuron (after Lewis 2002) **70** Pretarsus leg 4 (after Lewis 2002). *Cryptops melanotypus* holotype **71** Anterior margin of forcipular coxosternite **72** Ultimate leg tibial and tarsal saw teeth **73** Pretarsus of ambulatory leg (freehand sketch). *Cryptops niloticus* **74** Anterior margin of forcipular coxosternite (holotype Sudan) **75** Anterior margin of forcipular coxosternite (Yemen) **76** Anterior margin of forcipular coxosternite (Rodrigues, after Lewis 2002) **77** Pretarsus leg 5 (Rodrigues specimen 5). Scale lines: Figs 68, 69 = 0.5 mm. Figs 71, 24–26 = 0.25 mm. Figs 70, 72, 73, 77 = 0.1 mm.

side (Fig. 68). Not *each* side with 3+4–4+5 as stated by Lewis (2002) in his diagnosis. Poison gland calyx ovoid, situated in anterior quarter of trochanteroprefemur. Posterior margin of sternite 21 straight. Coxopleural pore field occupying no more than anterior 70% of coxopleuron, with 33–65 pores and several minute setae in pore field (Fig. 69). With 5–8 tibial and 3–4 tarsal saw teeth. Legs 1–20 with 2 minute pretarsal accessory spurs (Fig. 70).

Distribution. Mauritius (SW Indian Ocean)

Remarks. Lewis (2002) wrote "the small individuals …are very similar to [Mauritian] *C. decoratus* [sensu Lewis] from which they may be distinguished by their minute tarsal claws [should have read minute pretarsal accessory spurs] a minor but consistent character, and incomplete tergite sulci". In a specimen of 10.5 mm the posterior margin of sternite 21 is rounded rather than straight. The Mauritius "*C. decoratus*" is synonymised under *C. melanotypus* in this paper (see below).

Cryptops medius Verhoeff, 1901

http://species-id.net/wiki/Cryptops_medius

C. medius Verhoeff, 1901 N. Acta Ac. Leop 77: 430.
C. anomalans: Kraepelin, 1903 Mitt. Naturhist. Mus. Hamburg 20: 26.
C. (*C.*) *medius*: Attems, 1930 Das Tierreich 54: 211.
C. medius: Zapparoli, 2002 Fragm. Ent. 34: 71.

Distribution. Greece.

Remarks. Verhoeff (1901) noted that it was of the size and habit of *hortensis* but pale yellow. The brief description is insufficient to distinguish it from *C. hortensis*. It was regarded as a synonym of *C. anomalans* by Kraepelin (1903). Zapparoli (2002) notes that the identity of this species must be checked. It is here regarded as a nomen dubium.

Cryptops melanotypus Chamberlin, 1941

http://species-id.net/wiki/Cryptops_melanotypus
Figs 71–73

C. melanotypus Chamberlin, 1941 Pomona Coll. J. Ent. Zool. 33: 42.
C. decoratus: Lewis, 2002 J. Nat. Hist. 36: 95, figs 27–35. **Syn. n.**
C. decoratus: Lewis, 2007b Phelsuma 15: 18, figs 17–25. **Syn. n.**
C. decoratus: Lewis, 2010a In: Gerlach & Marusik (eds) The Arachnida and Myriapoda of the Seychelles Islands p. 283, figs 14–15.

Material examined. NMNH. Holotype. *Cryptops melanotypus* C. From Philippines at Honolulu Dec 27, 1937 27–387. [In packing material about *Den*(*robium*) *superbum* from the Philippine Islands].

Diagnosis. Length: 9–16 mm. With or without dark subcuticular pigment. Cephalic plate without sutures. Anterior margin of forcipular coxosternite slightly curved and with 2 (3) submarginal setae on each side. Posterior margin of sternite 21 straight or rounded. Coxopleural pore field occupying no more than anterior 60% of coxopleuron, with 6–17 pores, 0–8 setae in coxopleural pore field, 0–3 posterior to it. Ultimate leg prefemur with a longitudinal glabrous area medially. With 4–7 tibial and 3 (4) tarsal saw teeth. Legs 1–20 with two short pretarsal accessory spurs.

Description of holotype. (Chamberlin's (1941) data in parentheses where relevant).

Length 9 mm. Tergites 3–20 with dark brown (black) pigment on either side of heart and along lateral edges with patches between tergite 21 with faint median posterior patch. Sternites 2–20 with pigment patches.

Antennal articles 10[r]-16. Cephalic plate without sutures, overlappe by tergite 1. Anterior margin of forcipular coxosternite slightly curved on each side, with 2 long and 2 very short submarginal setae on right and 2 long and 3 very short on left. Those on left appear mostly marginal probably due to distortion (Fig. 71).

Tergites with incomplete median ridge from 7–17, lateral crescentic sulci from 3, incomplete paramedian sulci from 6 but these latter very difficult to determine as the cuticle is wrinkled longitudinally as seen in specimens in early stages of ecdysis (first and subsequent tergites bisulcate, the sulci mostly complete). Traces of paramedian sutures seen only on tergite 10 and 15 in the cleared specimen. Sternite cruciform sulci not observed. Sternite 21 with broadly rounded posterior corners, posterior margin straight.

Coxopleuron with 17 pores, 6 beneath the margin of sternite 21, the pore field occupying the anterior 60% of coxopleuron and without setae. Two setae between pore field and posterior margin on which there are 5 setae. Ultimate legs (loose) with long fine setae, a longitudinal glabrous area medially on prefemur. Tibia with 7, tarsus 1 with 3 sharp saw teeth (Fig. 72). Legs 1–19 with long fine setae, tarsi clearly divided from 17, pretarsal accessory spurs short (Fig. 73).

Distribution. Philippines, Mauritius, Seychelles.

Remarks. The holotype is small and delicate, nevertheless most characters are visible. The absence of minute setae from the coxopleural pore field may be a juvenile character. It has a relatively high number of coxal pores and ultimate leg saw teeth for such a small specimen. With the current state of our knowledge it is, however, not possible to separate it from the "*C. decoratus*" populations from Mauritius and the Seychelles, described above, which I regard as conspecific with it and hence junior subjective synonyms.

***Cryptops nigropictus* Takakuwa, 1936**
http://species-id.net/wiki/Cryptops_nigropictus

C. nigropictus Takakuwa, 1936 Trans. Sapporo nat. Hist. Soc. 14: 238, figs 4 & 5.
C. niloticus Lewis, 1967 Proc. Linn. Soc. Lond. 178: 201, figs 23–37. **Syn. n.**

? *C. niloticus*: Lewis: 1969 J. Nat. Hist. 3: 464.
C. kalobensis Goffinet, 1971 Rev. Zool. Bot. Afr. 83: 51, figs 1–3. **Syn. n.**
C. basilewskyi Matic & Darabantu, 1977. La Faune Terrestre de l'ile de Sainte-Helene. Quatrième Partie, 2. Chilopoda: 353, fig. 142 (a-f). **Syn. n.**
C. niloticus: Zapparoli, 1990b Lav. Soc. Ital. Biogeogr N. S. 14: 144.
C. niloticus: Lewis, 1996 Fauna of Saudi Arabia 15: 146, figs 14–15.
C. niloticus: Lewis, 2002 J. Nat. Hist. 36: 96, figs 44–52.
C. nigropictus: Chao, J.-L. & Chang, H.-W 2006 Norw. J. Entomol. 53: 145.
C. nigropictus: Chao, J.-L. & Chang, H.-W. 2008 Collection and Research 21: 4, figs 3, 4.
C. nigropictus: Song et al. 2010 Acta Zootaxonomica Sinica 35: 376, figs 1–8.
C. nigropictus: Chao, J.-L. 2008 Scolopendromorpha (Chilopoda) of Taiwan.VDM Verlag Dr. Müller, Saarbrücken p. 71, figs 72, 75–81+Map 11.

Diagnosis. Length 11–18 mm. Tergites with dark subcuticular pigment. Anterior margin of forcipular coxosternite slightly curved, typically with 2 long and several shorter submarginal setae on each side. Poison gland calyx rounded, situated in anterior part of forcipular trochanteroprefemur. Posterior margin of sternite 21 rounded. Coxopleural pore field with 7–25(31) pores and 0–6 setae in pore field and 3–9 posterior to it. Ultimate leg with 4–8 tibial and 3–4 tarsal saw teeth. Legs 1–20 with a single long pretarsal accessory spur.

Description of neotype. (Based on Chao and Chang's (2008) text and figures). Length 11–18 mm. Tergites with dark subcuticular pigment. Cephalic plate short faint oblique sutures (presumably extending back from the bases of the antennae). Clypeus with 6 prelabral setae. Anterior margin of forcipular coxosternite slightly curved, with 2 submarginal setae on each side. Poison gland calyx rounded, situated in anterior part of forcipular trochanteroprefemur. Tergites 1 and 2 with a faint central longitudinal sulcus. Posterior margin of sternite 21 rounded. Coxopleural pore field occupying no more than anterior 50% of coxopleuron, with 10–13 large pores and apparently without setae in pore field. Ultimate leg with 5–6 tibial and 3–4 tarsal saw teeth. Legs 1–20 with a single long pretarsal accessory spur.

Distribution. St. Helena, Democratic Republic of Congo, Sudan, ?Eritrea, Somalia, Yemen, Mauritius, Rodrigues, Philippines, China, Taiwan, and Ryuku Islands (Japan). Not French Polynesia as stated in Minelli (2006).

Remarks. The apparent close similarity of *C. basilewskyi*, *C. kalobensis* and *C. niloticus* to *C. nigropictus* suggests that all four are representatives of a single widely distributed species (see Discussion for a fuller examination of this thesis). *C. nigropictus* is the senior subjective synonym.

***Cryptops niloticus* Lewis, 1967**

http://species-id.net/wiki/Cryptops_niloticus
Figs 74–77

C. niloticus Lewis, 1967 Proc. Linn. Soc. Lond. 178: 201, figs 23–37.
? *C. niloticus*: Lewis, 1969 J. Nat. Hist. 3: 461–470.

C. niloticus: Zapparoli, 1990b Lav. Soc. Ital. Biogeogr. N. S. 14: 144.
C. niloticus: Lewis, 1996 Fauna of Saudi Arabia 15: 146, figs 14–15.
C. niloticus: Lewis, 2002 J. Nat. Hist. 36: 96, figs 44–52.

Material re-examined. BMNH Holotype BMNH(E) 200011 Chilo 1996.9.62 Sudan 28.ix.1964. Holotype Reg. No. 1966.9.6.2. Khartoum, Sudan 28.ix.1964. Paratype Reg. No. 1966.9.6.3. Khartoum, Sudan 9.ix.1962.

Description (Sudanese material) Length 16 (male)–20 mm (female). With dark brown subcuticular pigment. Cephalic plate without or with very short posterior paramedian sutures. Anterior margin of forcipular coxosternite typically 2+2(3) and several smaller setae some just submarginal (Fig. 74). Poison gland calyx spherical or subspherical situated in anterior region of forcipular coxosternite. Posterior margin of sternite 21 broadly rounded. Pore field occupying anterior 70% of coxopleuron with 10–25 (31) pores. With 5 setae in pore field, 3 between pore field and posterior margin on which there are 4 or 5 setae (these data from 2 specimens only). Ultimate legs with 4–7 tibial and 3 tarsal saw teeth. Pretarsi of legs 1–20 each with a single long accessory spur 54–66% of length of pretarsus.

Non-Sudanese material. The brief description of the specimens from Eritrea precludes definite confirmation of identity. They were destroyed in a fire at Ahmadu Bello University, Zaria, Nigeria. A male from the Yemen (Lewis 1996), body length 11 mm with 2+2 large and 2+1 small submarginal coxosternal setae (Fig. 75), with only 5+5 coxopleural pores was mature. Specimens from Rodrigues, body length 13 mm, have anterior margin of coxosternite as in Fig. 76, coxopleural pores 7–11, ultimate leg with 6–7 tibial and 3–4 tarsal saw teeth. One of the three specimens had a very narrow median longitudinal glabrous area on the ultimate pretarsus. Pretarsal accessory spur 50% the length of the pretarsus (Fig. 77). Zapparoli (1990) recorded the species from Somalia.

Remarks. Lewis (2002) gave forcipular coxosternite with 5+5 to 6+7 small to large setae in an irregular row in a diagnosis for *C. niloticus* as opposed to coxosternite with 2+2 to 3+3 large submarginal setae for *C. decoratus*. This distinction is difficult to maintain. The setae are likely to increase in length and number with the size of the individual and different growth pattern of different populations may lead to such differences: individuals reach a relatively large size in the Sudanese population with concomitant increase in the number of coxopleural pores. The populations identified as *C. niloticus* from Sudan, Yemen, Somalia, Rodrigues and possibly Eritrea, I regard as conspecific with *C. nigropictus* of which *C. niloticus* is a junior subjective synonym (see p. 35).

Cryptops orthus Chamberlin, 1951

http://species-id.net/wiki/Cryptops_orthus

Cryptops orthus Chamberlin, 1951 Publ. Cult. Cia. Diamant. 10: 108
nec *C. philammus*: Demange, 1968 Biol. Gabonica 4: 292.

Diagnosis. (Data from Chamberlin 1951). Length: 9 mm. Without dark subcutaneous pigment. Cephalic plate without sutures. Anterior margin of forcipular coxosternite nearly straight with 3 fine setae on each side. Posterior margin of sternite 21 "gently convex". Pore field widely separated from caudal margin of coxopleuron, with comparatively few pores. Setae of prefemur and femur of ultimate leg fine rather than spine-like; with 4 tibial and 3 tarsal saw teeth.

Distribution. Angola.

Remarks. The limited data provided by Chamberlin (1951) do not allow *C. orthus* presently to be separated from *C. nigropictus*, *C. decoratus* or *C. melanotypus* nor from the inadequately described *C. campestris* from Rwanda and the Democratic Republic of Congo. It is not, as Demange (1968) supposed, a junior synonym of C. *philammus* which belongs to the *doriae* group of species. The type material should be examined, however, Rowland Shelley (personal communication) writes "*C. orthus* appears to be lost, as it is not included in my listing of any museum, including the MCZ [Museum of Comparative Zoology, Harvard University], which also has many Chamberlin types." It is here regarded as a nomen dubium.

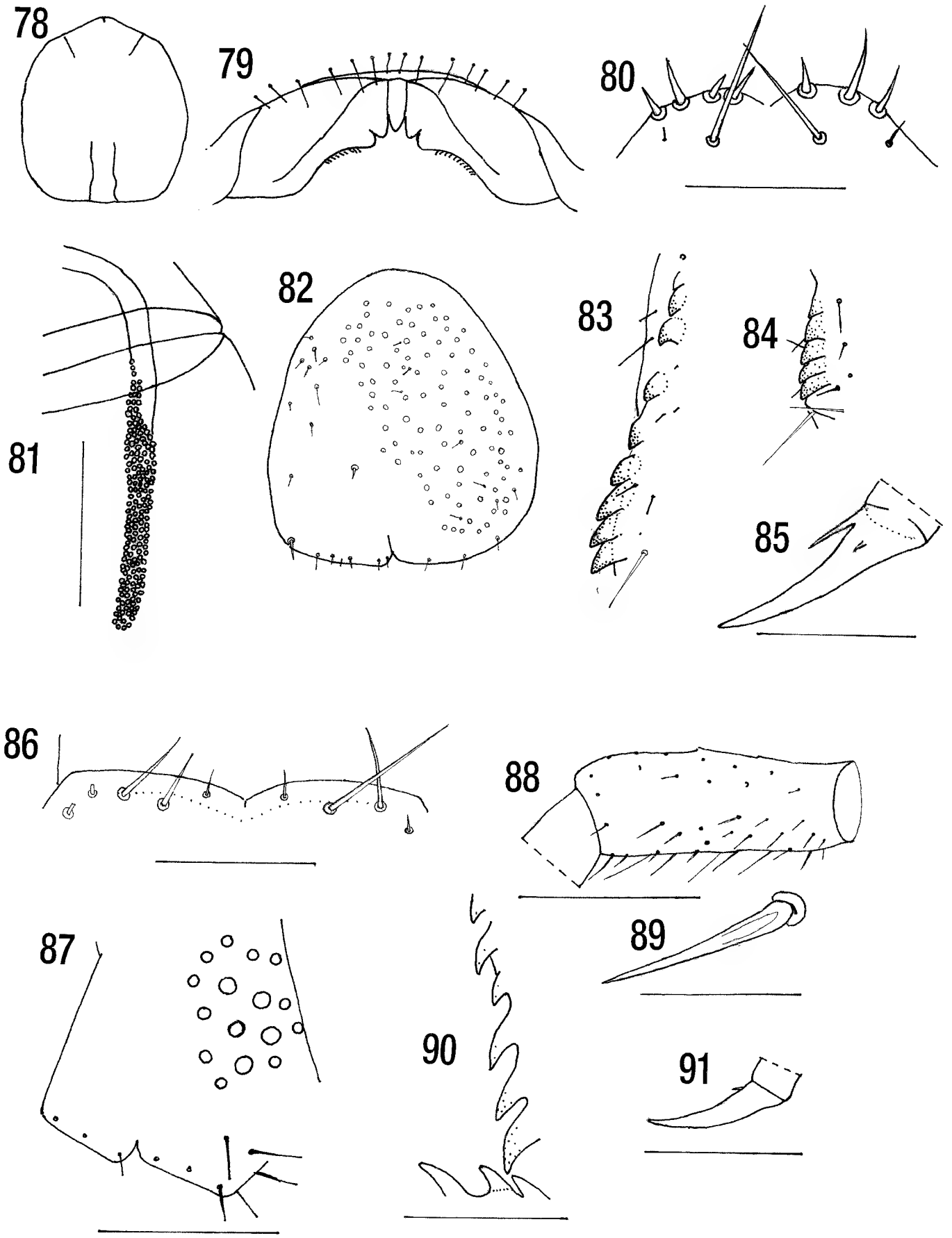
***Cryptops parisi parisi* Brolemann, 1920**

http://species-id.net/wiki/Cryptops_parisi_parisi

Figs 78–85

C. parisi Brolemann, 1920 Bull. Soc. Hist. Nat. Toulouse 48: 9, figs 1–5.
C. parisi var *cristata* Brolemann, 1925 Bull. Soc. Hist. Nat. Toulouse 53: 194.
C. parisi: Brolemann, 1930 Faune de France, Chilopodes: 214, figs 351–363.
C. parisi transsilvanius Verhoeff, 1931 Zool Jb. (Syst.) 62: 274, 278 Table 3, fig. 14.
C. parisi genuinus var. *rhenanus* Verhoeff, 1931 Zool. Jb. (Syst.) 62: 274. **Syn. n.**
C. parisi cottarellii Matic, 1977 Fragm. Ent. 13: 5, figs 4, 5 A-E. **Syn. n.**

Description. Length 15–25 mm. Without dark subcuticular pigment. Cephalic plate, with sutures extending only a short way back from the bases of the antennae and posterior sutures occupying the posterior third of the cephalic plate (absent in young animals) (Fig. 78). Labral sidepieces notched in most specimens (tridentate labrum) (Fig. 79), sometimes notched on one side only but not notched (unidentate) in some Iberian populations (Lewis 2009). Clypeus with 8–15 prelabral setae. Anterior margin of forcipular coxosternite narrower than in *C. hortensis* more protuberant, usually with four stout marginal setae on each side (Fig. 80). Poison gland calyx elongated, tubular, reaching halfway down the forcipular trochanteroprefemur (Fig. 81). Coxopleural pore field of 50 or more small pores extending almost to posterior margin, generally with 8–20 setae in pore field (Fig. 82). Prefemur of ultimate leg without median ventral longitudinal groove. Generally with 6–12 tibial (Fig. 83) and 4–8 overlapping tarsal saw teeth (Fig. 84) often fused to form a ridge in large specimens (*C. parisi* var. *cristata* Ribaut, 1925). Legs 1–20 with one short and one longer pretarsal accessory spur (Fig. 85).



Figures 78–91. *Cryptops parisi parisi.* **78** Cephalic plate (after Brolemann 1930) **79** Labrum (after Pichler 1987) **80** Anterior margin of forcipular coxosternite (after Lewis 2009) **81** Calyx of poison gland (after Lewis 2009) **82** Coxopleuron (after Eason 1964) **83** Ultimate leg tibial saw teeth (after Brolemann 1930) **84** Ultimate leg tarsal saw teeth (after Brolemann 1930) **85** Pretarsus leg 5 (after Lewis 2009). *Cryptops stabilis.* **86** Anterior margin of forcipular coxosternite (specimen 2) **87** Right coxopleuron (holotype) **88** Prefemur of ultimate leg medial (holotype) **89** Ventral seta from ultimate leg prefemur (holotype) **90** Ultimate leg tibial and tarsal saw teeth (holotype) **91** Pretarsus leg 16 (holotype). Scale lines = 0.1 except Fig. 84 = 0.5 mm. Fig. 87 = 0.25 mm. Figs 85 & 89 = 0.05 mm.

Distribution. Netherlands, Germany, France, Italy (excluding Sardinia and Sicily), Austria, former Czechoslovakia, Slovenia, Croatia, Bosnia-Herzegovina, Montenegro, FYR Macedonia, Albania, Romania, Bulgaria, mainland Greece (including Ionian Is.), N. Turkey, European Russia (Transcarpathia); synanthropic in UK and Ireland, introduced in Scandinavia and Canada (Newfoundland).

Remarks. Brolemann (1920) described the coxopleural pore field as occupying only half the surface. Later (Brolemann 1930) he described it as not reaching the posterior margin. Eason (1964) stated that it extends almost to the posterior margin and Koren (1986) that it extends over the entire ventrolateral surface, increasing in extent with size of the individual. Iorio and Geoffroy (2003) examined a large sample of the species and recorded variation in the number of saw teeth on the ultimate legs, the number of setae in the coxopleural pores fields and prelabial setae.

Cryptops parisi cottarellii Matic, 1977

http://species-id.net/wiki/Cryptops_parisi_cottarellii

C. parisi cottarellii Matic, 1977 Fragm. Ent. 13: 5, figs 4, 5 A-E.

Description. (Data from Matic 1977). Length 19 mm. Colour yellow. Cephalic plate with short sutures extending only a short way back from the bases of the antennae and posterior sutures occupying the posterior third of the cephalic plate. Tergite 1 without sutures and overlying posterior margin of cephalic plate. Labral sidepieces notched (tridentate labrum). Anterior margin of forcipular coxosternite narrower than the forcipular trochanteroprefemur, each side curved and with four setae. Poison gland calyx elongated, tubular, reaching almost halfway down the forcipular trochanteroprefemur. Coxopleural with numerous pores, the pore field extending almost to posterior margin, with 7 setae in pore field. With 7 tibial and 2 or 3 tarsal saw teeth in a crest. Tarsi of legs 1–19 not divided. (Some data extracted from Matic's 1977 figures).

Remarks. This Turkish subspecies is not listed in Minelli (2006). In his differential diagnosis Matic gave poison gland very elongated in *C. p. parisi* as opposed to elongated in *C. parisi cottarellii* and tibia with 7–9 and tarsus with 4–5 saw teeth in the former and 7 and 1 in the latter. However he gave 2–3 tarsal saw teeth in his description for *C. p. cottarellii.* Iorio and Geoffroy (2003) noted that there are only 3 tarsal saw teeth in immature individuals of *C. p. parisi* (less than 13 mm). The differences do not seem sufficient to designate a subspecies, the description is, moreover, based on a single specimen which may be atypical. *Cryptops parisi cottarelli* is a junior subjective synonym of *C. parisi* as Zapparoli (1999) suspected.

Cryptops parisi rhenanus Verhoeff, 1931

http://species-id.net/wiki/Cryptops_parisi_rhenanus

C. parisi genuinus var. *rhenanus* Verhoeff, 1931 Zool. Jb. (Syst.) 62: 274 (in key only).
C. parisi rhenanus: Verhoeff, 1934 Zool. Jb. (Syst.) 66: 48.

Remarks. Verhoeff (1931) distinguished two varieties of what he termed *C. parisi genuinus* namely var. *parisi* and var. *rhenanus*. His var. *rhenanus* would appear to be a trinomen and as such, being an infrasubspecific category, would be an unavailable name and is listed as such by Minelli (2006). I believe, however, that Verhoeff was using "*genuinus*" to indicate a typical *C. parisi* differentiating it from his *C. parisi* subsp. *transsilvanius* Verhoeff, 1931. Presumably using the term for taxa with more distinguishing features than his varieties. In a later paper (Verhoeff 1934) he refers *C. parisi rhenanus* i.e. to what would now be considered a subspecies.

Characterised mainly by the poison gland pore tube reaching almost to the base of the trochanteroprefemur as opposed to about the middle. Probably individual variation and regarded here as a junior subjective synonym of *C. p. parisi*. Locality not given but *rhenanus* means from the banks of the river Rhine.

Cryptops parisi sebini Verhoeff, 1934

http://species-id.net/wiki/Cryptops_parisi_sebini

C. parisi sebini Verhoeff, 1934: Zool. Jb. (Syst.) 66: 48.

Remarks. Listed as a valid subspecies by Minelli (2006). Verhoeff (1934) stated that it was like *C. p. rhenanus* but with anterior legs with spine-like setae and a transverse row of these on sternites 2–4. Tergite 1 with a round posterior depression and tergites 2 and 3 with a double oval depression. Further information is required about this form which is from Italy (Pisogne). It is here regarded as a nomen dubium.

Cryptops penicillatus Lawrence, 1960

http://species-id.net/wiki/Cryptops_penicillatus

C. penicillatus Lawrence, 1960 Faune de Madagascar 12. Myriapodes Chilopodes, p. 76, fig. 22 a-d.

Material examined. MNHN. Holotype. [Madagascar Centre: forêt de] Manjakatompo, Ankaratra Mts 2,000 m, I 1956. (Forcipules are missing).

Description. (Additional data from Lawrence (1960) in parentheses).

Length 16.5 mm. Colour yellow, without dark subcuticular pigment. Antennal articles 12+11, the basal 2 with long, 3 with, in addition, some short setae. The number of short setae increase over 4, 5, and 6. An irregular basal whorl of long setae from 4. Cephalic plate without sutures. (Tergite 1 without sutures and overlying posterior margin of cephalic capsule. Anterior margin of coxosternite weakly convex with 2+2 long and 3+3 short setae on each side [these data from Lawrence (1960) Fig. 22 c]. Poison gland calyx spherical, situated in anterior part of forcipular coxosternite).

(No paramedian sulci or sutures ("sillons") before tergite 7, indistinct on the other tergites. Lateral sulci only occupying the anterior third of each tergite, last 3 tergites without sulci). Sternites with deep wide longitudinal sulcus (on all sternites except the first), transverse sulcus very fine (none). Sternite 21 with corners broadly rounded and posterior margin straight (small, rounded).

Coxopleuron with 8 large pores (6–8) occupying anterior 55% of coxopleuron and with at least 6 minute setae in pore field. Six fine setae on posterior margin and 5 between this and the pore field. Ultimate legs with fine setae, the ventrolateral setae of the prefemur thicker, without a medial longitudinal glabrous area. Tibia with 6, tarsus 1 with 4 saw teeth (5+3). Legs 1–19 with fine setae, tarsi undivided, pretarsal accessory spurs very small. (Leg 20 three basal articles with a brush of setae ventrally).

Remarks. Described from Madagascar, *C. penicillatus* is very similar to and is here regarded as a *C. decoratus* lacking dark subcutaneous pigment of which it is a junior subjective synonym. For a full discussion of this see p. 23.

***Cryptops philammus gabonensis* Demange, 1968**
http://species-id.net/wiki/Cryptops_philammus_gabonensis

C. philammus gabonensis Demange, 1968 Biol. Gabonica, 4: 288, figs 8, 9.

Description. (Data from Demange 1968). A pigmented species. Anterior wall of forcipular coxosternite almost straight with 3+3 marginal setae with 1+1 long post-marginals. Tergite paramedian sulci commencing on tergite 8. Sternite longitudinal sulci absent. Anterior margin of forcipular coxosternite almost straight with 3 long marginal setae and one long seta behind the margin. Ultimate leg with 3, 4 or 5 tibial and 2 tarsal saw teeth. Demange (1968) in a table comparing *C. philammus* and *C. orthus* gave pore field with posterior pores near the margin (of the coxopleuron) implying that this is the case in *C. philammus gabonensis*.

Distribution. Gabon.

Remarks. The data available are insufficient for the exact identity of *C. p. gabonensis* to be determined. It is here regarded as a nomen dubium. As noted in the introduction, *C. philammus* has a saw tooth on the ultimate leg femur and thus belongs to the *doriae* group of species.

Cryptops songi Song, Zhu & Liang, 2010
http://species-id.net/wiki/Cryptops_songi

C. songi Song, Zhu & Liang, 2010 Acta Zootaxonomica Sinica 35: 378, figs 9–17.

Diagnosis. Maximum length 22 mm. Cephalic plate with very short posterior paramedian sutures, anterior margin of coxosternite with 3+3 long and 2+2 short setae. Tergites 3–20 with paramedian sulci, without dark subcutaneous pigment, posterior margin of sternite 21 straight, coxopleuron with 26 pores. Ultimate leg tibia with 7–8, tarsus with 2–4 saw teeth. Tarsi of most legs more or less divided.

Distribution. China.

Remarks. *Cryptops songi* would appear to be quite distinct from other Chinese species of the genus. It is clearly related to *C. nigropictus*, *C. decoratus* and *C. melanotypus* but further data are required to establish its exact relationship to them.

Cryptops stabilis Chamberlin, 1944
http://species-id.net/wiki/Cryptops_stabilis
Figs 86–91

C. stabilis Chamberlin, 1944 Notul. Nat. no. 147: 1.

Material examined. ANSP Holotype labelled Type 9921/lot 1398. *Cryptops stabilis* Ch. Malabar XII-1920 in a small unlabelled micro vial in a larger vial in which there was a second specimen placed in a second microvial and labelled *C. stabilis* second specimen by J. G. E. L. The two are certainly conspecific.

NB. Chamberlin stated that the type from Goenoeng (=Gunung?) Malabar, Java was the only specimen seen.

Diagnosis. Length 11 mm. Without dark subcuticular pigment. Cephalic plate and all tergites without paramedian sutures or sulci. Each side of coxosternite with 2 large and 2–3 smaller submarginal setae. Poison calyx oval. Coxopleural pores large, pore field occupying anterior 60% of coxopleuron. Ultimate leg prefemur with medial longitudinal glabrous strip and with 6 tibial and 3 tarsal saw teeth. Legs 1–20 with minute pretarsal accessory spurs.

Description of holotype. (Chamberlin's (1944) data in parentheses where relevant).

Length 11 mm. Cephalic plate and tergite 1 orange, trunk light brown with darker subcuticular pigment (head and first and last tergites yellow or orange, the remaining portion of body dark).

Two basal antennal articles with long setae, third with long and many short, fourth and subsequent with dense short setae and irregular basal whorl of long setae. Cephalic plate without sutures. Tergite 1 without sutures and overlying cephalic plate. Anterior margin of forcipular coxosternite curved (widely convex) with 2 large and 2 small submarginal setae on each side (Fig. 86). Poison gland calyx oval.

Table 1. Status of the species of the *Cryptops hortensis* group of the Old World.

Species	Authority	Distribution	Status
C. basilewskyi	Matic & Darabantu, 1977	St. Helena	= C. nigropictus Syn. n.
C. brignolii	Matic, 1977	Turkey	Valid pro tem
C. campestris	Attems, 1953	Rwanda & DRC	Nomen dubium
C. compositus	Chamberlin, 1952	Turkey	Nomen dubium
C. covertus	Chamberlin, 1951	Angola	Valid
C. daszaki	Lewis, 2002	Mauritius	Valid
C. decoratus	Lawrence, 1960	Madagascar	Valid
C. decoratus	sensu Lewis, 2002, 2007	Mauritius, Seychelles	= C. melanotypus Syn. n.
C. h. hortensis	(Donovan, 1810)	Europe, Central Asia, widely introduced	Valid
C. h. atlantis	Pocock, 1891	Madeira (?Azores, Canaries)	C. atlantis Stat. n.
C. inermipes	Pocock, 1888	Christmas I.	Valid
C. kalobensis	Goffinet, 1971	Democratic Republic Congo	= C. nigropictus Syn. n.
C. lobatus	Verhoeff, 1931	France, Italy	Valid
C. mauritianus	Verhoeff, 1939	Mauritius	Valid
C. medius	Verhoeff, 1901	Greece	Nomen dubium
C. melanotypus	Chamberlin, 1941	Philippines, Mauritius, Seychelles	Valid
C. nigropictus	Takakuwa, 1936	Afrotropical & Oriental regions	Valid
C. niloticus	Lewis, 1967	Afrotropical region	= C. nigropictus Syn. n.
C. orthus	Chamberlin, 1951	Angola	Nomen dubium
C. p. parisi	Brolemann, 1920	Europe, Turkey, Canada (introduced)	Valid
C. p. cottarellii	Matic, 1977	Turkey	= C. p. parisi Syn. n.
C. p. rhenanus	Verhoeff, 1931	Germany	= C. p. parisi Syn. n.
C. p. sebini	Verhoeff, 1934	Italy	Nomen dubium.
C. penicillatus	Lawrence, 1960	Madagascar	= C. decoratus Syn. n.
C. philammus gabonensis	Demange, 1968	Gabon	Nomen dubium
C. songi	Song et al., 2010	China	Valid
C. stabilis	Chamberlin, 1944	Indonesia (Java)	Valid

Tergites apparently without paramedian sutures or sulci in either specimen (median sulci absent). Lateral crescentic sulci on tergites 3–18. Sternites with cruciform sulci. Transverse skeletal thickening not observable. Sternite 21 in spm. 2 with posterior margin weakly convex.

Coxopleuron with 14+16 pores of varying size (Fig. 87), the pore field, which is without setae, occupying the anterior 64% of coxopleuron and 54% in spm 2. Two setae between the pore field and the posterior margin on which there are 4 large and 2 small setae. Prefemur of ultimate leg (Fig. 88) with strong setae (Fig. 89) of moderate

length on prefemur, some long ventral setae with an elongated glabrous strip on medial face. Femur with some strong setae, tibia and tarsus 1 and 2 with fine setae. Tibia with 6, tarsus with 3 saw teeth (Fig. 90). Legs 1–19 with undivided tarsi and fine setae. Leg 20 with dense setae ventrally on distal half of prefemur and ventrally on femur and tibia. Pretarsi of legs 1–20 long, with minute accessory spurs (Fig. 91).

Distribution. Indonesia (Java).

Remarks. If absence of tergite paramedian sutures and sulci is disregarded (possible juvenile character) then the species is close to *C. melanotypus.*

Provisional key to *Cryptops* s. str. species of the *hortensis* group

NB. Lewis (2009) concluded that some species of *Cryptops* exhibit dark subcuticular pigmentation, some may or may not exhibit it and others are never pigmented. The character is used in the key but should be treated with circumspection.

1 Tibia and tarsus of ultimate leg without saw teeth. Christmas Island ..... ***C. inermipes* Pocock, 1888**

– Tibia and tarsus of ultimate leg with saw teeth..... **2**

2 With the anterior edge of the forcipular coxosternite strongly bilobed. Each lobe with five short marginal setae (Fig. 66). France, Italy..... ***C. lobatus* Verhoeff, 1931**

– Anterior edge of the forcipular coxosternite not strongly lobed (at most as in *C. covertus*) (Fig. 17) **3**

3 Prefemur of ultimate leg with glabrous longitudinal ventral groove..... **4**

– Prefemur of ultimate leg without glabrous longitudinal ventral groove..... **5**

4 Coxosternal setae submarginal (Fig. 39), tibial saw teeth 5–8, tarsal 2–4. Europe and Atlantic Islands, western Central Asia. Widely introduced elsewhere..... ***C. hortensis* (Donovan, 1810)**

– Coxosternal setae fine, marginal (Fig. 46), tibial saw teeth 15–17, tarsal 5–6. Madeira, ?Azores and Canary Is ..... ***C. atlantis* Pocock, 1891**

5 Cephalic plate with paramedian sutures occupying posterior 30% (Fig. 78), labrum usually tripartite (Fig. 79), with 50 or more small coxal pores. Europe and SW Asia (Turkey)..... ***C. parisi* Brolemann, 1920**

– Cephalic plate without (Fig. 1) or with very short posterior paramedian sutures, labrum unipartite, coxopleuron with maximum of 26 (rarely to 31) pores..... **6**

NB. 1 Up to 50 pores in *C.* cf. *hortensis* a high altitude (1,000–1,300 m) population described from Kärnten, Austria, by Pichler (1987). A *hortensis*-like population but lacking the ventral groove on the femora of the ultimate legs.

NB. 2 The inadequately described *C. brignolii* near here.

6 Anterior edge of forcipular coxosternite bilobed with 6+6 stout marginal setae (Fig. 17) and about 25 coxopleural pores. Angola..... ..... ***C. covertus*** **Chamberlin, 1951**

– Anterior edge of forcipular coxosternite not markedly bilobed and with fine setae.....**7**

7 20–32 mm, with 33–65 coxopleural pores, pretarsal accessory spurs minute (Fig. 70), 3+4–5+5 long submarginal coxosternal setae (Fig. 68). Mauritius.. ..... ***C. mauritianus*** **Verhoeff, 1939**

– Maximum length 20 mm, with 7–25 (rarely 31 in Sudanese *C. nigropictus*) pretarsal accessory spurs short to long (except in *C. stabilis* where they are also minute).....**8**

8 Tergites without paramedian sutures or sulci, pretarsal accessory spurs minute. Length 11 mm. Java (may be an immature specimen)..... .....***C. stabilis*** **Chamberlin, 1944**

– Tergites with paramedian sutures (may be incomplete), pretarsal accessory spurs may be short but not minute **9**

9 Pretarsi of ambulatory legs each with a single long accessory pretarsal spur....**10**

– Pretarsi of ambulatory legs with two accessory spurs, the second sometimes very small and easily overlooked.....**11**

Cryptops songi Song et al., 2010 a species with short cephalic posterior paramedian sutures, without subcutaneous pigment and with 26+26 coxopleural pores, China (near here).

(The inadequately described *C. orthus* Chamberlin, 1951, Angola, and *C. campestris* Attems, 1953, Rwanda and Democratic Republic of Congo also near here).

10 Forcipular coxosternite with 2+3 fine marginal setae. Ultimate leg tibia with 3 saw teeth, tarsus with 2. Ambulatory legs with single long pretarsal accessory spurs (Fig. 27). 7.5 mm. Without dark subcuticular pigment. Mauritius (Île aux Aigrettes)..... ***C. daszki*** **Lewis, 2002**

– Forcipular coxosternite generally with 2+2 long submarginal setae and several shorter setae. Ultimate leg tibia with 4–8 saw teeth, tarsus with (2)3–4. With dark subcutaneus pigment. St. Helena, Sudan, Eritrea, Somalia, ?Yemen, Democratic Republic of Congo, Rodrigues, Taiwan..... ..... ***C. nigropictus*** **Takakuwa, 1936**

11 With 6–9 coxopleural pores, 5–9 setae between pore field and coxopleural margin, ultimate prefemur without medial longitudinal glabrous area. Madagascar..... ***C. decoratus*** **Lawrence, 1960**

– With 7–16 coxopleural pores, 1–3(4) setae between pore field and coxopleural margin, ultimate prefemur with broad medial longitudinal glabrous area. Philippines, Mauritius, Seychelles. ***C. melanotypus*** **Chamberlin, 1941**

Discussion

The separation of those *Cryptops* s. str. species lacking an anterior transverse suture on tergite 1 into two groups dependant on the presence (*doriae* group) or absence (*hortensis* group) of a saw tooth or teeth on the ultimate femur may prove to be artificial but is adopted as a convenient way of dealing with of this group of species pro tem. The character has been overlooked by some workers in the past and species that appear from their description to belong the *hortensis* group in fact belong to the *doriae* group (see Introduction). Evidence to suggest that this separation may, however, be a natural one, is provided by the fact that no species in the *doriae* group have been recorded from Europe and no members of the *hortensis* group have been recorded as naturally occurring in Australasia or the Afrotemperate region.

Ten of the species keyed out here are quite distinct. However, the status of *C. decoratus, C. melanotypus* and *C. nigropictus*, and the species that have here been synonymised with them and of *C. songi* is uncertain. These species would appear to be closely related. *C. nigropictus* has been separated from *C. decoratus* and *C. melanotypus* on the basis of the nature of the pretarsal spur(s): single and long in *C. nigropictus,* two and generally shorter in the other two "species".

C. niloticus from Sudan, Yemen, Rodrigues, Somalia and possibly Eritrea, *C. kalobensis* from Democratic Republic of Congo and *C. basilewskyi* from St Helena are synonymised under *C. nigropictus* itself recorded from China, Taiwan and the Ryuku Islands. It is thus a very widely distributed species. The Sudanese populations differ from others in that some specimens are larger; have more coxosternal pores and more submarginal coxosternital setae. A similar situation was reported by Lewis (2007a) for *C. doriae* with populations which differed in maximum length (13 mm in an introduced population in the United Kingdom, 33 mm in Nepalese specimens) he suggested that "we may be dealing with two closely related species distinguishable only on size, or the differences may be the result of differential; growth rates and number of stadia in different habitats".

The synonymising of *C. decoratus* sensu Lewis (2002, 2007b) from Mauritius and Seychelles under *C. melanotypus* from the Philippines likewise gives this species a wide distribution. (*C. decoratus* s. str. is thus only recorded from Madagascar). The poorly described *C. campestris* from Rwanda and Democratic Republic of Congo clearly belongs to this group of species. Whether we are dealing with three separate species, as they are treated here, a larger number of sibling species, or populations of one variable species is, with the present information available, a matter of opinion. More material and more refined techniques are required to ascertain their exact status. A compromise position has been adopted in this paper. Whatever their status, however, there can be little doubt that they are closely related and very widely distributed taxa. This suggests that some *Cryptops* species are easily dispersed over large distances, undoubtedly by human activity in the case of *C. hortensis.* Verhoeff (1940) remarked on the wide distribution of species of the genus and their presence on many islands of different continents. This he ascribed to their ability to cling to float-

ing trees or "islands" using their ultimate legs and thus transported during storms at sea. Rafting may, or may not, be significant but it would present the animals with major osmoregulatory problems. Alternatively, the wide distribution may indicate an alternative dispersal mechanism or that *Cryptops* is an ancient genus with slowly evolving species.

Acknowledgements

I am greatly indebted to the following for the loan of material: Don Azuma (ANSP), Jan Beccaloni (BMNH), Jean-Paul Mauriès (MNHN), Jonathan Coddington, Scott F. Larcher, Gary F. Hevel and David G. Furth (NMNH), Jürgen Gruber and Verena Stagl (NMW) and Rudy Joqué (MRAC). My thanks are also due to Dennis Parsons and staff of the former Somerset County Museum, now part of the Somerset Heritage Service, for providing excellent working conditions in that Museum. Thanks also to Roger Lewis for processing the figures, to an anonymous reviewer for very detailed and constructive comments on the manuscript and to Pavel Stoev for his help and advice.

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